DEPARTMENT OF
HOUSING

PUERTO RICO DISASTER RECOVERY ACTION PLAN

For the use of CDBG-DR Funds
in response to 2019-2020
Earthquakes and 2020
Tropical Storm Isaias
(DR- 4473-PR) and (DR-4560-PR)

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PLEASE READ FIRST

DRAFT FOR PUBLIC COMMENTS

PUBLIC COMMENT PERIOD

START: NOVEMBER 4, 2022

END: DECEMBER 4, 2022

This is a draft document subject to change.

DATE	SUMMARY OF CHANGES
Published for public comment: 11/4/2022	AMENDMENT 1: SUBSTANTIAL AMENDMENT Modifications in this amendment include: • changes to the unmet needs assessment to include Tropical Storm Isaías as per 87 FR 6364, as well as to expand the most impacted and distressed (**MID**) area; • a new mitigation needs assessment as required by 87 FR 6364 for the use of the mitigation set-aside; and • information on public outreach and stakeholder engagement efforts post-submission of the original Action Plan. Programmatic changes include: • change in program name to Home Repair, Reconstruction and Relocation Program (R3); • budget redistribution; • the *Southern Consortium for Management and Administration of Federal Earthquake Damage Funds from January 2020* (**ConSur**, for its Spanish acronym) as a program subrecipient; • direct selection as an additional method of distribution; • relocation as an eligible activity (max. award $200,000); • repair max. award $60,000; • reconstruction max. award $215,000; • PV systems and water storage systems max. award $30,000; • costs in excess of program caps allowed on a case-by-case basis and when necessary to comply with federal accessibility standards or to reasonably accommodate a person with functional diversity; • mitigation activities set-aside; and • 3 additional MID area set-asides (for a total of 7 municipality set-asides) and a corresponding budget redistribution.

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY:

The 2019-2020 Southwest Puerto Rico Earthquake Sequence

On December 28, 2019, an increase in seismicity started an earthquake sequence with an event of 4.7 magnitude ~~4.7~~ that shook a population ~~that~~ who had never before experienced a seismic event of this power ~~before~~.[1] Although the archipelago of Puerto Rico lies in a tectonically active region, the Island had not been shaken ~~struck~~ by a major earthquake since the year 1918. Earthquakes differ from other natural hazards, such as floods, hurricanes, or wildfires, in that earthquake swarms can last for weeks, years, or decades, rather than occurring as just one event or season. Additionally, earthquakes represent a particularly severe threat due to irregular time intervals between these events, lack of adequate forecasts, and the catastrophic damage that can occur as a result of a significant event of this nature.

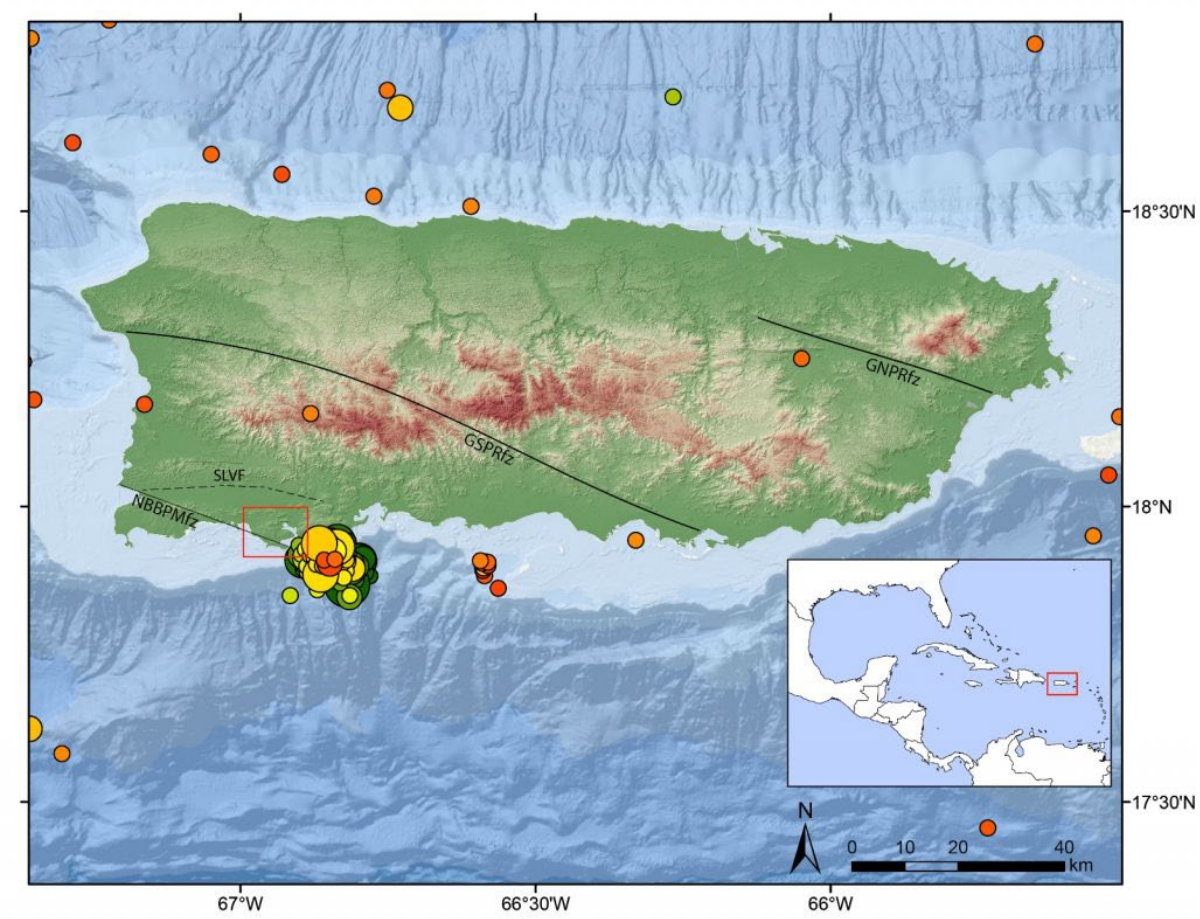


Figure 1: Events larger than M 2.5 detected by the Puerto Rico Seismic Network between December 8, 2019 to January 7, 2020. Source: Puerto Rico Seismic Network

[1] López, A.M., Hughes, K.S., & Vanacore, E. (2020), Puerto Rico's Winter 2019-2020 Seismic Sequence Leaves the Island On Edge, Temblor, http://doi.org/10.32858/temblor.064.

An earthquake is caused by the release of stored energy within the Earth's tectonic plates or along their edge ~~of, the tectonic plates of the Earth~~. ~~They~~ Earthquakes are characterized by a sudden shaking of the earth. The severity of their shock ~~an earthquake~~ depends on its epicenter ~~place of origin~~ (place of origin ~~epicenter~~) and the amount of energy released. Upon the occurrence of ~~the~~ an earthquake, seismic waves radiate from the earthquake source (e.g., crust, inner core, outer core, mantle), causing the movement of the plates, thus, the shaking of the Earth. The severity of the tremor increases as energy is released and decreases according to its distance from the epicenter. The tremors can be felt hundreds of miles from its epicenter. The intensity of shaking is the result of several factors, such as: the extent and type of earthquake, the distance from the epicenter, the area's soil conditions, and the relative orientation of the site with respect to the seismic event.[2]

On January 7, 2020, a 6.4 magnitude earthquake, the main shock of the 2020 Southwest Puerto Rico earthquake sequence, displaced thousands of Puerto Ricans from their homes and resulted in extensive damage to the Island's built environment including individual homes and critical infrastructure. The~~is~~ early January 2020 earthquake led to a confirmed fatality and island-wide power cuts. After ~~As of~~ January 10, 2020, three (3) more ~~persons~~ people died because of health conditions ~~that~~ which local officials indicated might be related to the temblor's effects.[3]

Figure 2: Damage from 6.4 earthquake on January 7, 2020 in Guayanilla

[2] Puerto Rico Department of Housing, CDBG-MIT Action Plan~~, effective April 19, 2021~~. Accessed at: https://cdbg-dr.pr.gov/en/download/cdbg-mit-action-plan-amendment-1-substantial-effective-on-october-17-2022/(English) and https://cdbg-dr.pr.gov/download/plan-de-accion-cdbg-mit-enmienda-1-sustancial-efectivo-el-17-de-octubre-de-2022/ (Spanish). ~~https://cdbg-dr.pr.gov/en/download/cdbg-mit-action-plan-effective-on-april-19th-2021/~~

[3] Mazzei, P., Penn, I., and Robles, F. (2020, January 11). With Earthquakes and Storms, Puerto Rico's Power Grid Can't Catch a Break. *NY Times.* Accessed at: https://www.nytimes.com/2020/01/10/us/puerto-rico-electricity-power-earthquake.html

Major Disaster Declaration DR-4773-PR & HUD CDBG-DR Allocation

On January 11, 2020, the Governor of Puerto Rico~~, Wanda Vázquez Garced,~~ requested an expedited major disaster declaration from ~~that~~ the President of the United States ~~Trump declare an expedited major disaster~~ as a result of the continuous seismic activity on the Island. The ~~United States~~ President declared an emergency under the Stafford Act on January 7, 2020, which initially authorized assistance for emergency protective measures. On January 16, 2020, the President ~~Trump~~ signed the major disaster declaration DR-4773-PR authorizing the Federal Emergency Management Agency (**FEMA**) to provide aid for Individual Assistance (**IA**) and Public Assistance (**PA**) in the designated areas, and Hazard Mitigation throughout Puerto Rico. Additionally, the major disaster declaration authorized Small Business Administration (**SBA**) Disaster Loans. Responsibility for PA administration was delegated to the Central Office of Recovery, Reconstruction, and Resiliency (**COR3**).

Public Law 116-20 appropriated $2,431,000,000 through the Community Development Block Grant Disaster Recovery (**CDBG-DR**) Program. The assigned funds were to be used to address specific infrastructure needs of selected 2017 disasters, remaining unmet disaster recovery needs for disasters in 2018 and 2019, and provide any remaining funds to support mitigation activities for 2018 disasters. On January 2021, HUD published the Federal Register Notice Vol. 86, No. 3 (~~Wednesday,~~ January 6, 2021), 86 FR 569, which allocated a total of $85,291,000 in CDBG-DR funds to multiple grantees appropriated by the Additional Supplemental Appropriations for Disaster Relief Act.~~, among which t~~ The Commonwealth of Puerto Rico was allocated a total of $36,424,000.

As per the Federal Register 86 FR 569, the Municipalities of Guánica, Yauco, Guayanilla, and Ponce were the HUD-identified Most Impacted and Distressed (**MID**) areas, and these were required to be given funding priority in the recovery from the disasters caused by the 2019-2020 seismic sequence.

Major Disaster Declaration DR-4560-PR & Second HUD CDBG-DR Allocation

On July 29, 2020, the Governor of Puerto Rico issued Executive Order 2020-059 declaring a state of emergency considering the imminent impact of Tropical Storm Isaías. From July 29-31, 2020, Tropical Storm Isaías passed just south of Puerto Rico impacting the southern and southwestern sections of the Island with tropical force gusts and significant rainfall. Rainfall accumulations ranged from four (4) to eight (8) inches, with some areas of weastern Puerto Rico reporting more than ten (10) inches during the event. There were several reports of impassable primary and secondary roads, as well as numerous landslides affecting local roadways.

After also declaring a state of emergency, on September 9, 2020, the President of the United States signed the major disaster declaration DR-4560-PR authorizing FEMA to provide IA in the designated areas, and Hazard Mitigation throughout Puerto Rico.

Public Law 117-43 appropriated $5,000,000,000 through the CDBG-DR Program for necessary expenses related to disaster relief, long-term recovery, restoration of

infrastructure and housing, economic revitalization, and mitigation in the MID areas resulting from a qualifying major disaster in 2020 or 2021. On February 2022, HUD published the Federal Register Notice Vol. 87, No. 23 (February 3, 2022) known as Consolidated Notice, 87 FR 6364, which allocated a total of $184,626,000 in CDBG-DR funds to Puerto Rico for major disaster declarations DR-4773-PR (2019-2020 Earthquakes Sequence)[4] and DR-4560-PR (Tropical Storm Isaías).

As per 87 FR 6364, the Municipalities of Guánica, Ponce, Yauco, Guayanilla, Peñuelas, Lajas, and Mayagüez were the HUD-identified MID areas, and these were required to be given funding priority in the recovery from the disasters caused by the 2019-2020 seismic sequence and Tropical Storm Isaías.

~~Unmet Needs Assessment~~

~~PRDOH analyzed the unmet needs, considering the preliminary assessments completed to date by the U.S. Federal Government under FEMA response and factors in long-term resilience based on historical methods. Although the grantees receiving an allocation for a 2018 or 2019 disaster may propose the use of funds for unmet economic revitalization and infrastructure needs, the Federal allocation notice and prior notices, require grantees to primarily consider and address its unmet housing recovery needs.~~[5]

~~Since data from prior disasters indicates that initial FEMA loss estimates often under-represent the full breadth of impact, either through unit counts or with loss estimates, PRDOH has utilized methodologies, based on HUD frameworks, and applied indicators to extrapolate impact for residents who may not have been fully evaluated in the initial assessments. This has provided an initial assessment of approximately $1,035,000,000 in housing impact throughout the Island, for which $43,582,442 had been made available until May 2020 from FEMA through the Individual & Households Program (**IHP**) program. Accounting for structural hardening costs needed to withstand continued ground movement, the estimate is an initial $1,368,156,231 in housing unmet need based on FEMA indicators adjusted for HUD rebuilding estimates.~~

~~However, PRDOH recognizes that HUD conducted an analysis that calculated the Serious Unmet Housing Need for the MID Areas, based on best available data from FEMA and SBA. The breakdown of said assessment is shown in **Table 1** below. This assessment was taken into consideration for the distribution of the funding set-asides for the CDBG-DR Housing Program.~~

[4] According to 87 FR 6364, 6370, "If a disaster has previously received CDBG–DR funding for a portion of the unmet needs calculated for the disaster, which is the case for Puerto Rico that had received 2019 disaster funding for the **earthquakes that occurred in both 2019 and 2020**, then the amount allocated from 2020 funds reflects the total unmet needs calculated above, the 15 percent mitigation for the total unmet needs, less the CDBG–DR funding previously received."
[5] 86 FR 569, 570.

~~***Table 1: MID Areas Unmet Housing Need Summary***~~

~~**HUD-identified Housing Unmet Needs on MID Areas**~~	
~~**MID Area**~~	~~**Serious Unmet Housing Need Estimate**~~
~~**Guayanilla**~~	~~$3,607,329~~
~~**Yauco**~~	~~$9,289,370~~
~~**Ponce**~~	~~$3,291,009~~
~~**Guánica**~~	~~$13,561,198~~
~~**Total Most Impacted Areas**~~	~~**$29,748,906**~~

~~It is important to differentiate the needs assessment that was conducted to calculate the $1,324,284,531 in housing unmet need, which was part of an analysis that is traditionally used to extrapolate impact and account for resiliency, from the HUD-identified serious unmet housing need estimate. Firstly, HUD data extracts the serious damage amounts from SBA and FEMA data for a point in time, whereas the needs assessment estimates hope to account for consequential impact that was not captured and other jurisdictions not identified as MID Areas, even beyond Municipalities that are not within the disaster declaration area.~~

Stakeholder Engagement Process

The stakeholder engagement process can be summarized in two phases: the efforts undertaken as part of the initial Action Plan draft development process, and the outreach and public input activities conducted as part of the Action Plan public comment period. The affected Municipalities in the HUD-identified MID Areas were considered critical stakeholders for the plan preparation, as they would be the partners that would support the implementation of the program. On the other hand, citizens and other affected entities participated and provided valuable feedback on the initial Action Plan draft, as is shown in the results of the engagement.

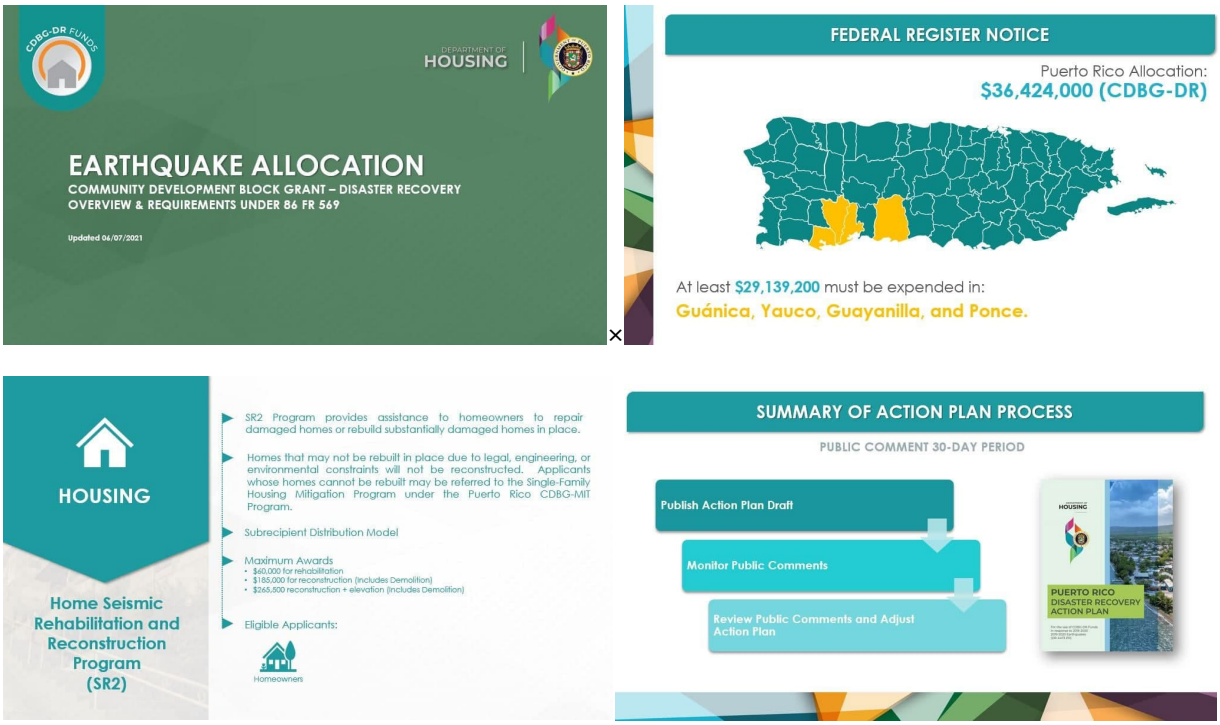
Stakeholder Engagement Efforts During Plan Preparation

As per HUD guidance found at 83 FR 5844, 5854-5855, PRDOH conducted a series of stakeholder engagement and outreach activities to integrate data, research, and stakeholder input as part of the initial Action Plan development phase. The stakeholder engagement efforts utilized allowed PRDOH to consult with disaster-affected local governments, and local public housing authorities in determining the use of funds. Additionally, other valuable stakeholders, such as States, Federal partners, nongovernmental organizations (**NGO**s), the private sector, academic sector and other stakeholders and affected parties in the surrounding geographic area were

incorporated into the draft development process to ensure the action plan's effectiveness.

A Presentation and Working Session was held on June 7, 2021, with the Municipalities identified by HUD as MID Area ~~Municipalities~~ in the first allocation notice: Yauco, Ponce, Guayanilla and Guánica. Presentation included providing an overview of the Earthquake allocation, Program design draft and program budget set-aside. Mayors, Municipal Staff and Municipal representatives for all MID Area local governments were present during the Presentation and Working Session. Mayors from the MID Municipalities submitted formal comments to the initial Action Plan Draft through a signed letter sent on June 15, 2021.

In the month of June 2021, the Public Housing Administration (**AVP**, for its acronym in Spanish) was contacted and consulted to determine impacts in the MID Area and feedback on the Action Plan design.



Public Outreach and Stakeholder Engagement Efforts Post-Submission of the Action Plan

Following the 2019-2020 Earthquakes Action Plan submission, publication, and approval, PRDOH has conducted additional outreach and engagement efforts with two (2) main focuses:

- Performing targeted engagement activities with the entities that will be responsible for the implementation of the program and
- Informing the progress of the ongoing planning efforts to the public.

Targeted Engagement with Implementing Entities

PRDOH held, coordinated, and participated in five (5) targeted engagement efforts with the impacted Municipal Governments who have self-organized into the *Southern Consortium for Management and Administration of Federal Earthquake Damage Funds from January 2020* (**CONSUR**, for its Spanish acronym).

These engagement events sought to increase collaboration, build capacity, and continue taking collaborative steps towards the successful execution of the Action Plan's programmatic outcomes. The table below summarizes the outreach events:

Table 2: Summary of Targeted Engagement

EVENT NAME	DATE	EVENT TYPE	PARTICIPATING ENTITIES
HUD Visit to ConSur	June 6, 2022	Meeting	PRDOH, HUD, Municipalities of Guánica, Guayanilla, Lajas, Peñuelas, Ponce, and Yauco.
Technical Assistance Workshops	July 13, 2022 - July 14, 2022	Workshops	PRDOH, HUD, Municipalities of Guayanilla, Lajas, Ponce and Yauco.
ConSur Meeting on SR2 Program: SRA Requirements and Scope	August 8, 2022	Meeting	PRDOH, and Municipalities of Guánica, Guayanilla, Lajas, and Ponce.
ConSur Meeting on SR2 Program: Capacity Assessment and SRA Timeline	August 29, 2022	Meeting	PRDOH, and Municipalities of Guánica, Guayanilla, Lajas, Ponce, and Yauco.
SRA Execution and Outreach	September 30, 2022	Press Event	PRDOH, and Municipalities of Guánica, Guayanilla, Lajas, Peñuelas, Ponce, and Yauco.

Public Outreach Regarding Ongoing Efforts

The initial Action Plan was approved by HUD on September 23, 2021. Since the approval, PRDOH has published additional documents and outreach materials to keep the impacted individuals, concerned stakeholders, and general public informed on the planning efforts. PRDOH developed and published the draft of the *Action Plan for Program Administrative Costs CDBG-DR Earthquakes & Storm Allocation* in the publicly available website. Concerned stakeholders had the opportunity to provide comments to the document during the public comment period, which were addressed by responses

from PRDOH through a published document on the CDBG-DR website. The HUD-approved *Action Plan for Program Administrative Costs* was later published on the website. Additional public outreach efforts included the Press Release that informed the public of the Subrecipient Agreement execution with the Consortium ConSur. This Press Release was widely distributed nationwide through local press.[6]

Table 3: Public Outreach Summary

OUTREACH ACTIVITY NAME	TYPE	DATE
Draft for Public Comment: Action Plan for Program Administrative Costs CDBG-DR Earthquakes & Storm Allocation	Website Post	May 4, 2022
PRDOH Responses to Public Comments to the Action Plan for Program Administrative Costs CDBG-DR Earthquakes & Storm Allocation	Website Post	May 26th, 2022
Final Approved Action Plan for Program Administrative Costs CDBG-DR Earthquakes & Storm Allocation	Website Post	June 21, 2022
Press Release on the SRA Execution with ConSur	Press Release	September 30, 2022

Housing ~~Seismic Rehabilitation and~~ Repair, Reconstruction and Relocation Program (**R3**)

Understanding the allocation requirements to prioritize housing, as well as the identified MID areas unmet needs ~~identified~~, and incorporating input from the disaster-impacted Municipalities and other stakeholders, PRDOH has developed the Housing ~~Seismic Rehabilitation and~~ Repair, Reconstruction and Relocation Program (**R3**) ~~(**SR2**)~~. The~~is~~ program has been designed to provide assistance to homeowners to repair damaged homes~~, or~~ rebuild substantially damaged homes in place, or relocate from high-risk areas. The reconstruction of substantially damaged homes gives the opportunity for otherwise displaced families to return safely to their homes.

~~Homes that may not be repaired or rebuilt in place due to legal, engineering, or environmental constraints, may be referred to the Single-Family Housing Mitigation Program under the Puerto Rico Community Development Block Grant – Mitigation Program (**CDBG-MIT**). Thus, providing opportunity to align programs under PRDOH to best serve the citizens of Puerto Rico.~~

[6] See WIPR article at: https://wipr.pr/vivienda-firma-acuerdo-con-seis-municipios-del-sur-para-reparacion-de-propiedades-afectadas-por-terremotos/; Telemundo website post at: https://www.telemundopr.com/noticias/puerto-rico/vivienda-tiene-36-4-millones-para-municipios-del-sur-afectados-por-los-sismos/2399894/; WORA TV website post at: https://www.woratv.com/departamento-de-vivienda-firma-acuerdo-con-varios-municipios-del-sur/.

Conclusion

Since the impact of Hurricanes Irma and María, Puerto Rico has been affected by other unexpected disasters: ~~this alarming~~ seismic activity, tropical storm, hurricane, heavy rain, and the Covid-19 pandemic. As the recovery need~~s~~ in Puerto Rico increase~~s~~ with each disaster, the need for a coordinated approach between agencies and local governments, as well as the recovery and mitigation programs launched, is ever present. The Government of Puerto Rico has been allocated over $20 billion in CDBG-MIT and CDBG-DR funding for reconstruction and mitigation activities. While there are limitations due to the CDBG-DR funds allocated for the hurricanes Irma and María requiring tie-back to the storms, other funding such as the CDBG-MIT funds allocated allow for financing long-term planning and risk mitigation activities, with a focus on preventing loss of life and suffering from future hazardous events.

The availability of the CDBG-DR and CDBG-MIT funds is a unique and critical opportunity for the Island. The effective implementation of the outlined recovery and mitigation programs will provide Puerto Rico the potential to rebuild stronger, better, smarter, and in a more sustainable manner. Using the lessons learned from previous events and building on the capacity acquired through the execution and performance of the variety of economic development, housing, infrastructure, and planning programs that are underway, Puerto Rico will achieve its recovery, and more importantly, increase its resilience to future events.

UNMET NEEDS ASSESSMENT

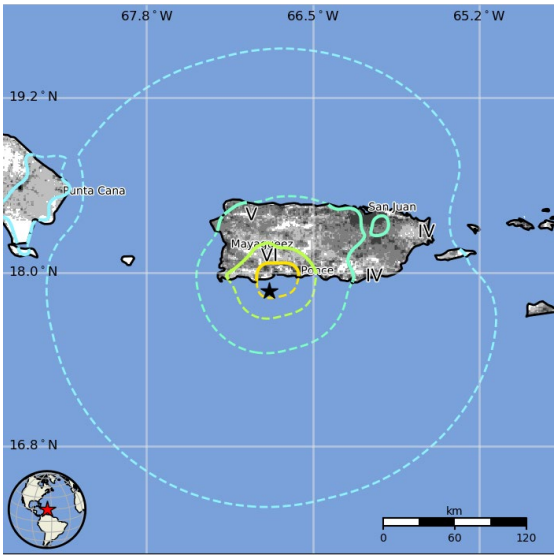
UNMET NEEDS ASSESSMENT

Summary of Earthquake Impact:

Assessment of 2020 Earthquake and Seismic Activity Long-Term Impact

On January 7, 2020, a 6.4 magnitude earthquake, the main shock of the 2020 Southwest Puerto Rico earthquake sequence, displaced thousands of Puerto Ricans from their homes and resulted in extensive damage to the Island's built environment including individual homes and critical infrastructure. Seismic activity has continued to be felt by Puerto Rico citizens in the southwest of the Island. Puerto Rico is located where the Caribbean and the North American tectonic plates meet, with the Island being compressed between the two plates, causing ongoing seismic events of varying scale. Tremors have occurred with a magnitude ranging from an estimated 4.5 to 6.4. Puerto Rico lies in a tectonically active region where earthquakes have occurred for centuries, but events of this magnitude had not occurred in decades.

Recent U.S. Geological Survey (**USGS**) studies have mapped the estimated population exposure to earthquake shaking, based on the Modified Mercalli Intensity (**MMI**) scale which is shown in **Figure 3** and can be further explored in the USGS Interactive Map. Studies conducted by the USGS forecast that aftershocks will continue for years.[7]



MMI	Shaking	Population
I	Not Felt	0 k*
II-III	Weak	148 k*
IV	Light	1,399 k
V	Moderate	1,758 k
VI	Strong	224 k
VII	Very Strong	165 k
VIII	Severe	2 k
IX	Violent	0 k
X	Extreme	0 k

*Estimated exposure only includes population within map area (k = x1,000)
Modified Mercalli Intensity (MMI) scale

Figure 3: Estimated Population Exposure to Earthquake Shaking on mainshock ocurring on January 7, 2020. Source: USGS[8]

[7] van der Elst, N.J., Hardebeck, J.L., and Michael, A.J., 2020, Potential duration of aftershocks of the 2020 southwestern Puerto Rico earthquake: U.S. Geological Survey Open-File Report 2020–1009, 5 p., https://doi.org/10.3133/ofr20201009.
[8] Map of Estimated Population Exposure to Earthquake Shaking, contributed by USGS National Earthquake Information Center, last updated on March 31, 2021. Accessed at: https://earthquake.usgs.gov/earthquakes/eventpage/us70006vll/pager.

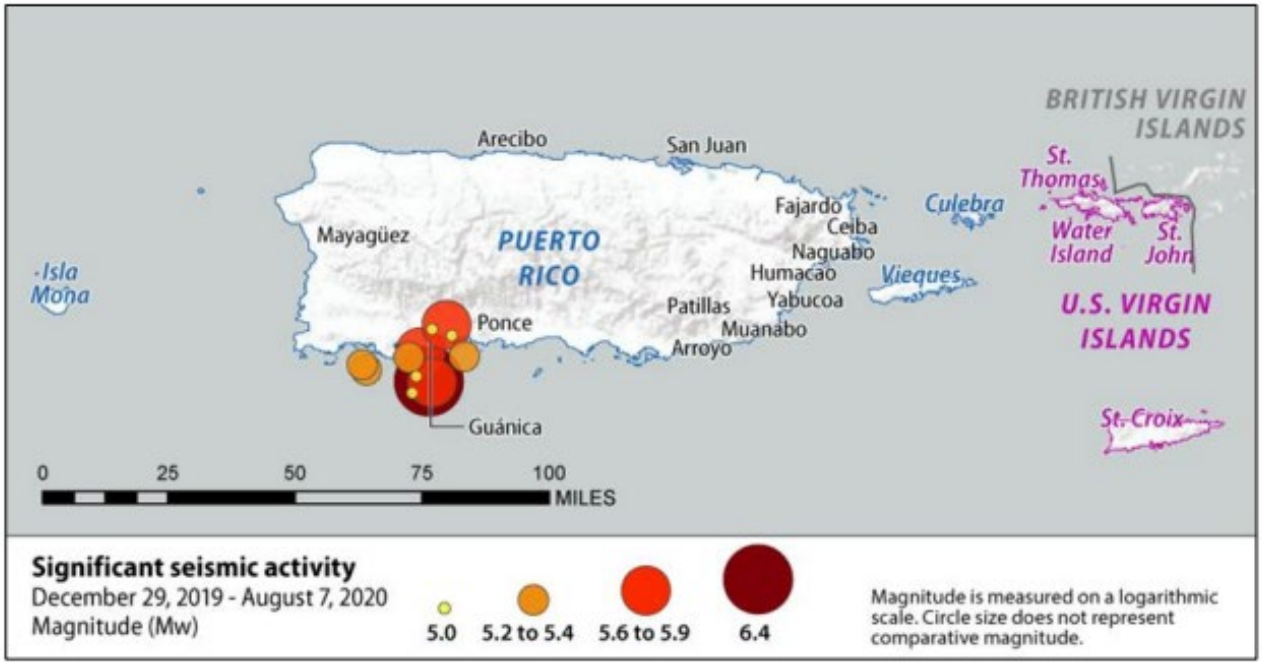


Figure 4: Significant Seismic Events in Puerto Rico from December 29, 2019 to August 7, 2020. Source: Congressional Research Service (CRS) Appendix A: Overview of the Earthquakes Affecting Puerto Rico Beginning in 2019[9]

The resultant damage caused by continuous ~~this~~ seismic activity is still a matter of investigation. The assessment contained herein considers the preliminary assessments completed to date by the U.S. Federal Government under the FEMA response and factors in long-term resilience based on historical methods.

The ~~Although the~~ grantees receiving an allocation for ~~a~~ 2018 or 2019 disasters may propose the use of funds for unmet economic revitalization and infrastructure needs, the Federal allocation notice and other prior notices require ~~grantees~~ to focus primarily ~~consider~~ and address its unmet housing recovery needs.[10] In consideration of this requirement and the amount of this grant allocation, this CDBG-DR Action Plan addresses the housing unmet needs in the HUD-identified MID area as a priority in the recovery from the disasters caused by the 2019-2020 seismic sequence. The MID areas, as identified by HUD, are the Municipio of Guánica, Yauco, Guayanilla, ~~and~~ Ponce, Lajas, and Peñuelas.

[9] Appendix A. Overview of the Earthquakes Affecting Puerto Rico Beginning in 2019, developed by Congressional Research Service. Accessed at: https://www.hsdl.org/?abstract&did=847372
[10] 86 FR 569, 570.

Housing

PRDOH has analyzed best available data, which indicates approximately 33,941 homeowner applicants and 5,916 renter applicants to FEMA for declared disaster FEMA-4473-DR with an estimate of damages within the Individual & Households Program (**IHP**) of $82,014,417 for homeowners as of April 24, 2021.[11]

PRDOH has utilized methodologies, based on HUD frameworks, and applied indicators to extrapolate impact for residents who may not have been fully evaluated in the initial assessments. This, ~~S~~since data from prior disasters indicates ~~that~~ FEMA initial ~~FEMA~~ loss estimates often under-represent the full breadth of impact, either through unit counts or with loss estimates~~,~~. ~~PRDOH has utilized methodologies, based on HUD frameworks, and applied indicators to extrapolate impact for residents who may not have been fully evaluated in the initial assessments.~~ PRDOH action ~~This~~ has provided an initial assessment of approximately $1,035,000,000 in housing impact, for which $43,582,442 had been made available until May 2020 from FEMA through the IHP program. Accounting for structural hardening costs needed to withstand continued ground movement, the estimate is an initial $1,368,156,231 in housing unmet need based on FEMA indicators adjusted for HUD rebuilding estimates.

Infrastructure Hybrid Assessment

A preliminary Hazus loss estimate performed by the FEMA Natural Hazards Risk Assessment Program (**NHRAP**) team, was conducted to assess damage resulting from the January 7, 2020, 6.4 magnitude earthquake with an epicenter 8.4 miles west-southwest offshore of Ponce, Puerto Rico. The Hazus model for loss estimation was based on the USGS ShakeMap version 4.[12] This preliminary loss estimate yielded $838,000,000 in total economic losses. **Figure 5** illustrates the preliminary estimates of economic loss per municipality. These are the best available estimates on infrastructure damage, based on the Hazus model, which "uses inventory information (buildings, infrastructure, and population), hazard extent and intensity data, and damage functions to estimate the impacts of disasters."[13]

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[11] Dataset was generated by FEMA's Enterprise Coordination & Information Management (ECIM) reporting team and is primarily composed of data from Housing Assistance Program reporting authority from FEMA registration renters and owners within the state, county, zip where the registration is valid. Accessed at: https://www.fema.gov/openfema-dataset-individuals-and-households-program-ihp-valid-registrations on April 26, 2021.

[12] USGS ShakeMap information can be accessed at: https://earthquake.usgs.gov/earthquakes/eventpage/us70006vll/pager

[13] What is Hazus? Accessed on April 30, 2021 at: https://www.fema.gov/flood-maps/tools-resources/flood-map-products/hazus/about

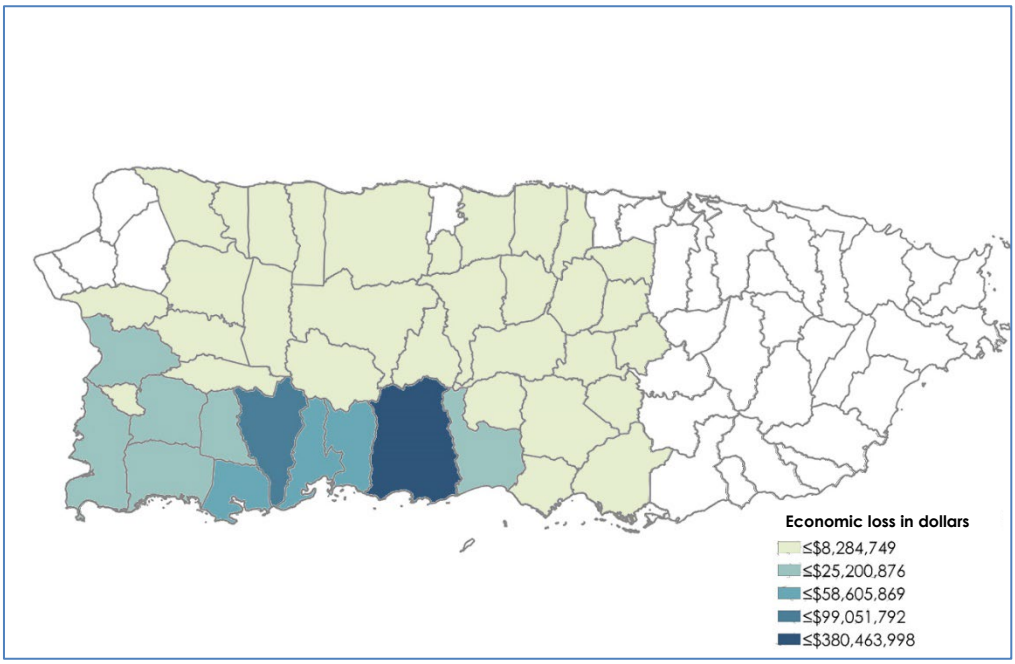
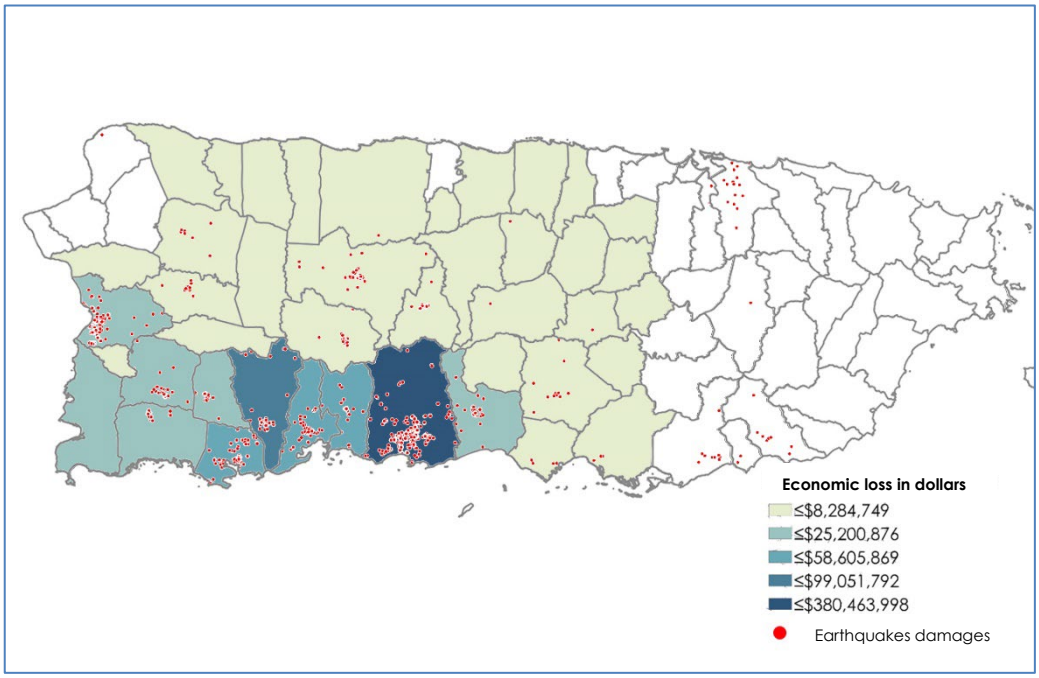


Figure 5 – HAZUS Results for Puerto Rico Earthquake - 01/07/2020

FEMA **PA** damage data was extracted from the FEMA Grants Portal on May 21, 2020. This data identified damages resulting from the earthquake on January 7, 2020, outside of the estimated economic loss areas identified in the NHRAP Hazus model shown in **Figure 5**. The map shown in **Figure 6** identifies the location of said PA damages in relation to the municipalities identified in the NHRAP Hazus model.

Figure 6 - PA Damages in Relation to the NHRAP Hazus Model



Because damage from the January 7, 2020, earthquake and/or subsequent events has occurred outside the NHRAP Hazus modeled area, it is reasonable to assume additional damage has occurred in areas surrounding PA damage site locations. It is also reasonable to assume the area surrounding PA damaged site locations have a higher probability of receiving economic damage. In an attempt to improve the NHRAP Hazus economic loss estimates, a hybrid assessment tool combining the NHRAP Hazus model with the area of PA damages was utilized to better understand the potential economic loss resulting from the January 7, 2020, earthquake and/or subsequent events.

To develop the hybrid assessment tool, the NHRAP Hazus model results have been converted to economic loss per capita. Each municipality in Puerto Rico has been scored based on estimated economic loss per capita, from zero (0) to four (4). Areas with a score of zero (0) have a very unlikely chance of receiving economic loss and areas with a score of four (4) have the highest chance of receiving economic loss, consistent with the NHRAP Hazus model. The PA damage areas have been developed by placing a three (3)-mile buffer around each reported PA damage site. Because damages are identified in areas outside NHRAP Hazus model areas, the PA damage areas are given a score of one (1) to capture non-NHRAP Hazus model areas as the lowest estimated economic loss classification. Yet, because PA damage areas include locations of real damage, areas with reported PA damage within the NHRAP Hazus model areas have been scored using the combined score. This has yielded a new hybrid assessment tool with a scoring of zero (0) to five (5). Areas with a score of zero (0) have a very unlikely probability of receiving economic loss and areas with a score of five (5) have the highest probability of receiving economic loss. **Figure 7** shows the process flow for combining the NHRAP Hazus model areas with the PA damages area and the resulting classification.

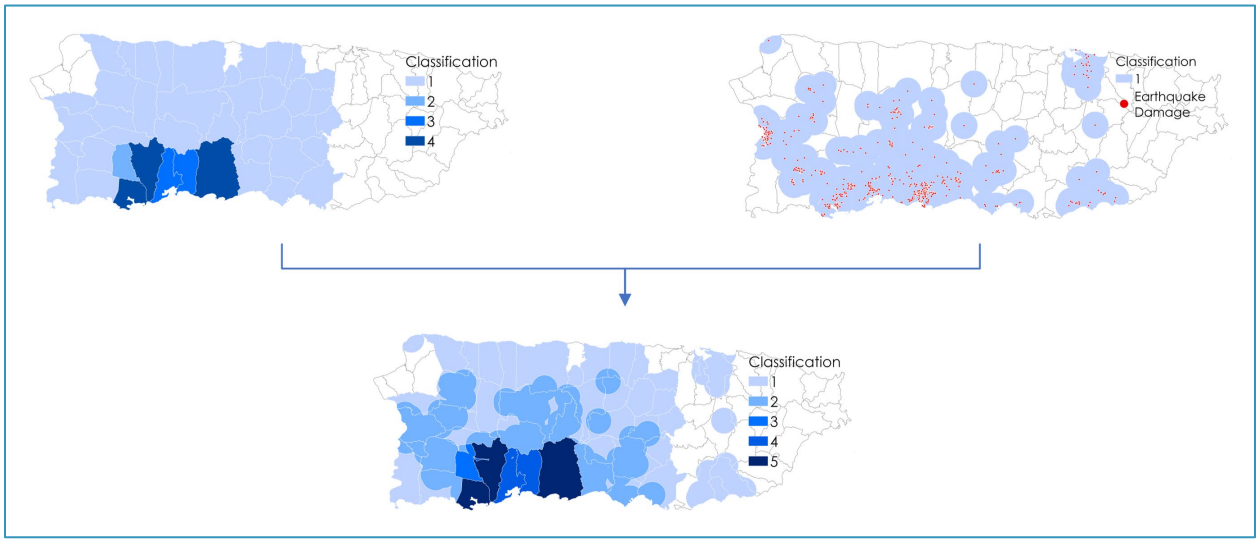


Figure 7: Process Flow of Combined NHRAP Hazus Model Areas and PA Damages Area

General Infrastructure

General infrastructure data housed in FEMA's Hazus loss estimation software has been classified by the geographic extent of losses derived from the hybrid assessment tool described above. The loss assessments include the percent of replacement cost shown in **Table 4 ~~2~~**. The list of FEMA Hazus software assets used in the assessment are included in **Table 5 ~~3~~**.

Table 4 ~~24~~: Percent of Replacement Cost and Classification for Loss Assessments

	Class 0	Class 1	Class 2	Class 3	Class 4	Class 5
Percent of Replacement Costs	0%	2.5%	5%	7.5%	10%	12.5%

Table 5 ~~53~~: General Infrastructure FEMA Hazus Software Assets

Airports	**Bus Stations**	**Communication Facilities**	**Electric Power Faculties**	**Emergency Facilities**	**Ferry Stations**
Hospitals	**Ports**	**Rail Bridges**	**Schools**	**Bridges**	

Utilizing the hybrid assessment tool, the estimated loss to general infrastructure is $745,000,000. The analysis of building losses to operational losses from Puerto Rico's experience with Hurricane María[14] results in an estimated additional loss of $1,673,000,000 to business operations from the earthquakes. The analysis of building losses to operational losses from Puerto Rico's experience with Hurricane María[15] results in an estimated additional loss of $569,000,000 to general infrastructure from the earthquakes.

Water and Wastewater Infrastructure

Water and Wastewater Infrastructure data provided by the Puerto Rico Aqueducts and Sewer Authority (**PRASA**) has been classified by the geographic extent of losses derived from the hybrid assessment tool. To estimate the costs for water and wastewater pipe system damage repair, this assessment used installed unit costs for similar pipe replacement and associated works such as pavement repair, valve and manhole replacement based on actual bid costs in the United States. Then it multiplied those unit costs by a factor of one-point-three (1.3) based on cost indices in a HUD study[16]

[14] CDBG-DR Action Plan Amendment 8 ~~6~~ (Nonsubstantial)~~, effective on March 15, 2021~~. Accessed at: https://cdbg-dr.pr.gov/en/action-plan/ (Ensgish) and https://cdbg-dr.pr.gov/plan-de-accion/ (Spanish). ~~https://cdbg-dr.pr.gov/en/download/action-plan-amendment-6-nonsubstantial-effective-on-march-15-2021/~~.

[15] Id.

[16] Construction Cost Indices HUD Section 202 and 811 Supportive Housing Programs Report prepared by NAHB Research Center, Inc. and Columbia Enterprises, Inc. for U.S. Department of Housing and Urban Development Office of Policy Development and Research Office of Housing, April 2005.

comparing construction costs for public housing units that showed higher construction costs in Puerto Rico compared to the average for all states in the study. Design and surveying costs were also included in the cost estimate and assumed to be twenty percent (20%) of the estimated construction cost. The assessment then developed cost scenarios to create an estimate of water and wastewater pipe system damage repair costs by assigning percent system damage to each of the five (5) impact areas with values greater than zero (0). **Table 6 4** below shows the percent ranges used, and the resulting estimate of repair/replacement costs.

Table 6 4:6 Water and Wastewater Cost Estimate – Low Range

	Class 0	Class 1	Class 2	Class 3	Class 4	Class 5	GRAND TOTAL
Percent Damage	0.00%	5.00%	10.00%	15.00%	20.00%	25.00%	
Estimated Water and Sewer Line Replace-ment Costs	$0	$185,937,000	$119,413,000	$8,308,000	$15,804,000	$123,163,000	**$452,625,000**

Economy

Economic damages have been assessed using methods similar to those employed in the Infrastructure Assessment. The ongoing nature of the earthquakes means that SBA data on equipment, furniture, and inventory is not yet available. However, estimating damage to commercial and industrial structures is possible utilizing data housed in FEMA's Hazus loss estimation software. Here, information on the value of commercial and industrial buildings for each census tract has been combined with the geographic extent of losses derived from Hazus and our current state of knowledge on infrastructure impacts. Each census tract was then categorized based on the minimum loss score derived from the combination of Hazus and PA loss estimates. The same loss multipliers utilized in determining potential infrastructure losses were applied to all census tracts to determine estimated losses to commercial and industrial buildings across Puerto Rico (**Table 7 ~~5~~**).

Table 7 ~~5~~7: Economic Impact Estimation Method

Damage Class	Value of Commercial and Industrial buildings Exposed	Loss Multipliers	Estimated Losses
5	2009412000	0.125	$251,176,500
4	32026000	0.100	$3,202,600
3	79408000	0.075	$5,955,600
2	1301848000	0.050	$65,092,400
1	16801734000	0.025	$420,043,350
0	7321812000	0.000	$0
Total Economic Sector Estimated Building Losses			$745,470,450

Estimated Losses Including 38% resilience addition	$1,028,749,221

This method results in estimated total losses to commercial and industrial buildings of $745,470,450. Including a thirty eight percent (38%) increase in building costs associated with rebuilding up to code standards so that buildings can better withstand future shocks and stresses drives estimated to losses to $1,028,749,221.

Estimating business operational losses required a slightly different approach because SBA data on business operational losses was not available. Here, applying the ratio of building losses to operational losses from Puerto Rico's experience with hurricane María[17] (.35) results in an estimated additional loss of $261,000,000 to business operations from the earthquakes.

Table 8 ~~68~~: Economic Sector Losses from Hurricane María

Economic Sector	Estimated Losses	Economic Sector	Estimated Losses
Real Estate	$312,990,105	Furniture	$19,183,223
Reconstruction	$38,849,868	Machinery	$77,838,409
Relocation	$97,576	Inventory	$25,289,941
Total Building Losses	$351,937,549	Total Operational Losses	$122,311,573

Overall, these methods produce a total economic sector estimated loss (buildings and operational) of $1.3 billion (see **Table 9 ~~7~~** below). The estimated impacts and unmet needs calculated as part this analysis include estimated damages as part of the assessment conducted in May 2020.

Table 9 ~~79~~: Total Economic Sector Losses from the ~~January~~ 2019-2020 Puerto Rico Earthquakes

Description	Estimate
Total Economic Sector Building Losses	$745,470,450
Accounting for 38% Resilience addition	$1,028,749,221
Accounting for 35% of building losses as estimate for operational losses	$260,914,658
Total Estimated losses to economic sector (Building and Operations)	**$1,289,663,879**

Summary of the unmet needs assessed utilizing overall estimates for Puerto Rico, in all three (3) sectors here analyzed is shown in **Table 10 ~~8~~**. Additionally, **Figure 8** allows to compare the estimates within the housing, economy, and infrastructure sector in proportion to each other.

[17] CDBG-DR Action Plan Amendment 6 (Nonsubstantial), effective on March 15. 2021. Accessed at: https://cdbg-dr.pr.gov/en/download/action-plan-amendment-6-nonsubstantial-effective-on-march-15-2021/.

Table 810: Overall Impacts and Unmet Needs

Sector	Estimated Damage	Funds Provided	Unmet Need	Plus resilience
Housing Estimate	$1,035,000,000	$43,582,442	$991,417,558	$1,368,156,230.04
Economy Estimate	$1,282,000,000	$35,700,000	$1,246,300,000	$1,719,894,000
Infrastructure Estimate	$1,673,000,000	$562,595,296	$1,110,404,704	$1,532,358,491.52
Total Estimate	***$3,990,000,000***	***$641,877,738***	***$3,348,122,262***	***$4,620,408,721.56***

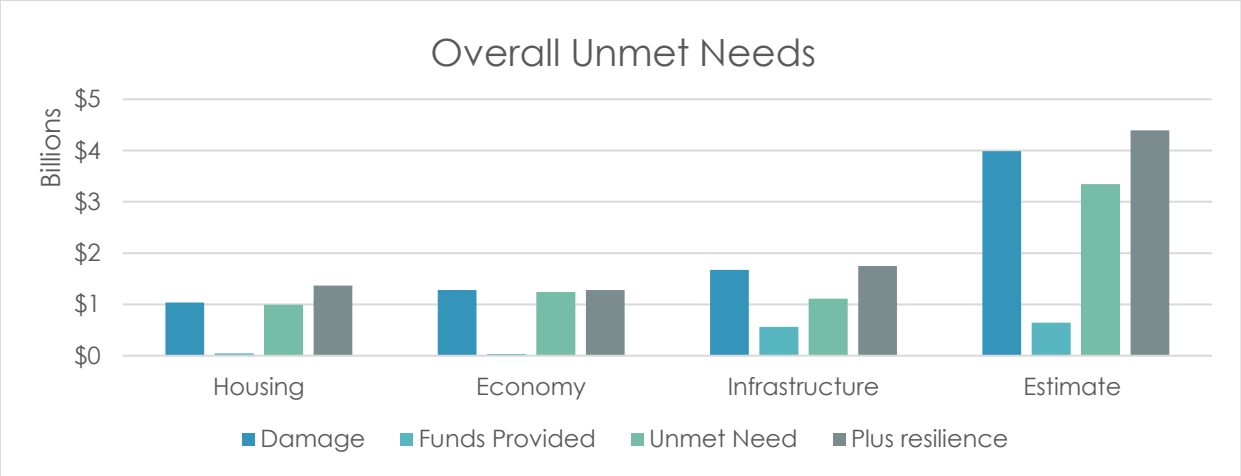


Figure 8: Overall Estimated Damage and Unmet Needs

Updated data on Municipalities that are designated for IA only are shown in **Table 11** ~~9~~ below, and **Table 12** ~~10~~ identifies the Municipalities where citizens are eligible for IA and the State, local, tribal, and territorial governments and certain private-non-profit organizations are eligible for PA. All the eligible Municipalities for listed below are mapped in **Figure 9**, which shows the geographic location of all the FEMA DR-4473-PR disaster-impacted Municipalities, categorized by the type of designated assistance for each.

Table 11 ~~*911*~~*: FEMA DR-4473-PR Designated Municipalities for IA Only*

Designated Municipalities for FEMA IA Only			
1. Aguada	2. Añasco	3. Arecibo	4. Barceloneta
5. Cabo Rojo	6. Ciales	7. Coamo	8. Corozal
9. Hormigueros	10. Lares	11. Maricao	12. Moca
13. Morovis	14. Naranjito	15. Orocovis	16. Rincón
17. Salinas	18. San Sebastián	19. Santa Isabel	20. Villalba

Table 12 ~~10~~12: FEMA DR-4473-PR Designated Municipalities for PA & IA

Designated Municipalities for FEMA PA & IA			
1. Adjuntas	2. Guánica	3. Guayanilla	4. Jayuya
5. Juana Diaz	6. Lajas	7. Las Marías	8. Mayagüez
9. Peñuelas	10. Ponce	11. Sabana Grande	12. San Germán
13. Utuado	14. Yauco		

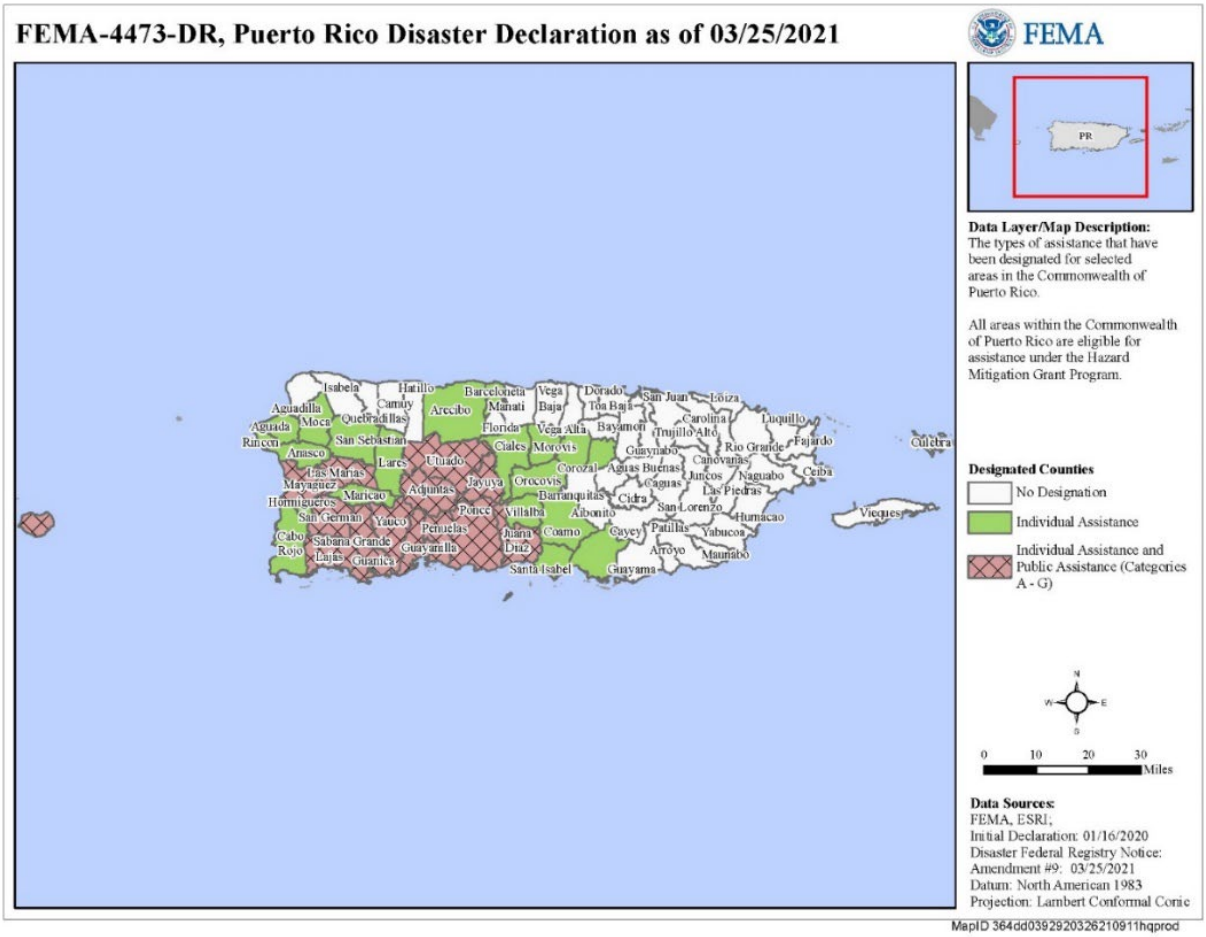


Figure 9: Designated Counties for FEMA Assistance under Puerto Rico Disaster Declaration FEMA-4473-DR as of March 25, 2021. Source: FEMA

Summary of Tropical Storm Isaías Impact

Housing

PRDOH has analyzed best available data, which indicates approximately 620 homeowner applicants and 228 renter applicants to FEMA for declared disaster FEMA-4560-DR with an estimate of damages within the Individual & Households Program of $1,326,459 for homeowners as of June 4, 2022.[18]

PRDOH has utilized methodologies, based on HUD frameworks, and applied indicators to extrapolate impact for residents who may not have been fully evaluated in the initial assessments. This, since data from prior disasters indicates FEMA initial loss estimates often under-represent the full breadth of impact, either through unit counts or with loss estimates. PRDOH action has provided an initial assessment of approximately $1,409,781 in housing impact, for which $624,024 had been made available until June 2022 from FEMA through the IHP program. Accounting for an additional 15% in funding needed to support rebuilding to higher standards (resilience), the estimate is an initial $785,757 in housing unmet need based on FEMA indicators adjusted for HUD rebuilding estimates.

Infrastructure and Economy

According to FEMA PA and SBA data, no infrastructure or economic impact was recorded.

HUD-Identified MID Areas

HUD uses the "best available" data to identify and calculate unmet needs for disaster relief, long-term recovery, restoration of infrastructure, and housing and economic revitalization. For the major disaster declarations DR-4473-PR and DR-4560-PR, the methodology for the identification of the MID areas detailed in 86 FR 570, 575-576 and 87 FR 6364, 6369, respectively, indicated that HUD designation is based on an analysis of FEMA and SBA data. As a result, HUD has identified the Municipalities of Guánica, Ponce, Yauco and zip codes within ~~Yauco~~ Peñuelas, Guayanilla, Lajas, ~~and Ponce~~ and Mayagüez Municipalities as the MID areas from this disaster declaration. As per HUD guidance at 86 FR 569, 570, if HUD designates a zip code as a MID area for purposes of allocating funds, the grantee may carry out activities within the whole county (in the case of Puerto Rico, county is equivalent Municipality) as a MID area. For the purposes of this Action Plan, it is PRDOH's determination to carry out the recovery activities throughout

[18] Dataset was generated by FEMA's Enterprise Coordination & Information Management (ECIM) reporting team and is primarily composed of data from Housing Assistance Program reporting authority from FEMA registration renters and owners within the state, county, zip where the registration is valid. Accessed at: https://www.fema.gov/openfema-dataset-individuals-and-households-program-ihp-valid-registrations on June 4, 2022.

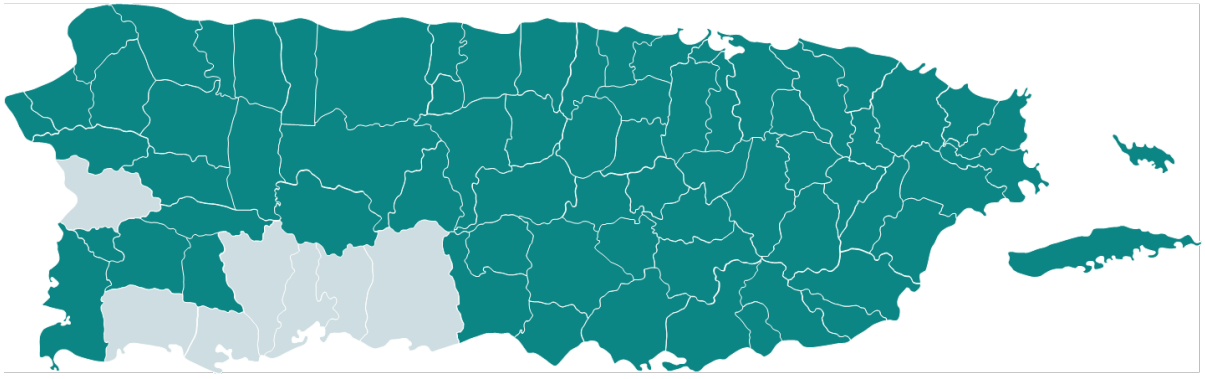
the entire territory of the Municipalities designated as MID under disaster declaration DR4473-PR, as presented in **Figure 10**.

Figure 10: HUD-Identified Most Impacted and Distressed Areas. Data Source: 86 FR 569,570

Based on this assessment, on January 6, 2021, HUD ~~has~~ allocated $36,424,000 of CDBG-DR ~~grant~~ funds to Puerto Rico ~~to assist in~~ for the recovery of the earthquakes that impacted the southern part of the Island in 2019 and its aftershocks early 2020 (DR-4473-PR). From this allocation, no less than $29,139,200 must be expended for unmet needs recovery in the MID areas, identified in **Figure 10**.

On February 3, 2022, HUD issued a second allocation of $184,626,00 for remaining unmet recovery needs from disasters DR-4473-PR and DR-4560-PR, expanding further the MID area to include Lajas, Peñuelas, and Mayagüez, identified in **Figure 10.1**.

Figure 11.1: HUD-Identified Most Impacted and Distressed Areas. Data Source: 87 FR 6364,6365



DEMOGRAPHIC PROFILE OF HUD-IDENTIFIED MID AREAS

An estimated population of ~~198,462~~ 320, 044 persons reside within the ~~four (4)~~ seven (7) Municipalities that were identified by HUD as the MID areas for the disaster declaration DR-4473-PR and DR-4560-PR. These Municipalities have experienced sustained population decline in the last decade, as indicated by the U.S. Census Bureau population estimates for ~~2019~~ 2021.[19] **Table 13 ~~11~~** shows the total populations by Municipality from April 2010 to July 2019, including the percent of population change, all of which are significantly higher than the average population percent change for Puerto Rico. Of the HUD-identified MID areas, Guánica has undergone the highest population decline with twenty-point-eight percent (20.8%), closely followed by Ponce, which is estimated to have decreased its population by twenty-point-seven percent (20.7%). From the 2020-2021 1-year period, it could be observed on **Table 14** a sustained decline in population.

Table 13 ~~13~~: 2019 Population Estimates and Percent Change for HUD-identified MID

Municipality	Population Estimate *U.S. Census Bureau, Population Estimates Program (PEP), Population estimates, July 1, 2019, (V2019)*	Population percent change *April 1, 2010 (estimates base) to July 1, 2019, (V2019)*
Ponce	131,881	-20.70%
Guayanilla	17,623	-18.30%
Yauco	33,575	-20.00%
Guánica	15,383	-20.80%
Total	**198,462**	**N/A**
Estimate for Puerto Rico	**3,193,694**	**-14.30%**

Table 14: 2020-2021 Population Estimates and Percent Change for HUD-identified MID Municipalities

Municipality	Population Estimate *U.S. Census Bureau, Population Estimates Program (PEP), Population estimates, July 1, 2021, (V2021)*	Population percent change *April 1, 2020 (estimates base) to July 1, 2021, (V2021)*
Ponce	135,084	-1.80%
Guayanilla	17,527	-1.40%
Yauco	33,633	-1.60%
Guánica	13,520	-1.90%
Lajas	23,151	-0.80%
Peñuelas	20,058	-1.70%
Mayagüez	71,939	-1.60%
Estimate for Puerto Rico	**3,263,584**	**-0.70%**

[19] The US Census Bureau produces estimates of the population for the United States, its states, counties, cities, and towns, as well as for ~~the Commonwealth of~~ Puerto Rico and its municipalities. The timing of the release of estimates varies according to the level of geography. US Census Bureau, Population Estimates (July 1, 2021 (V2021)) accessed on October, 2022, at: https://www.census.gov/programs-surveys/popest.html

Another sustained trend is the increasing number of over sixty-five (65) year population in Puerto Rico~~'s twenty-one-point three percent (21.3%)~~ which is twenty-two point seventy percent (22.70%) ~~population over the age of sixty-five (65) is higher than the U.S. average of sixteen-point five percent (16.5%)~~, as is shown in **Table 15~~2~~**. This is an important indicator to determine the social vulnerability of an area, as older adults are more vulnerable than other age groups because of the need for special care, the susceptibility to harm, and potential mobility constraints, all of which influence the ability to get out of harm's way.[20] Social imbalances historically tend to reduce women's status in society, their access to resources, opportunities, and power, subsequently leading to higher female vulnerability to adverse hazard and disaster outcomes.[21] In both indicators, Puerto Rico and the Municipalities within the HUD-identified MID areas have higher percentages than the U.S. average, as shown in **Table 15~~2~~** below, and those marked in darker blue and bolded, show a higher percentage than the Puerto Rico average.

Table 15 ~~14~~: Vulnerability Indicators for HUD-Identified MID Areas (area as per initial allocation notice)

Fact	United States	Puerto Rico	Ponce	Guayanilla	Yauco	Guánica
Persons 65 years and over, percent	~~16.50%~~ 17.1%	~~21.30%~~ 22.70%	~~**22.80%**~~ **24.50%**	~~**21.70%**~~ **23.20%**	~~**23.20%**~~ **25.00%**	~~**25.00%**~~ **26.50%**
Female persons, percent	~~50.80%~~ 51%	~~52.50%~~ 52.70%	~~52.00%~~ 52.20	~~**52.60%**~~ **53.00%**	~~52.30%~~ 52.50%	~~52.00%~~ 52.10%

As established by HUD, in the MID under DR-4473-PR, the 2015-2019 U.S. Census ~~of the USA~~ American Community Survey (ACS) will be evaluated to identify the population with disabilities and difficulties. While persons of differential ability reside in every part of Puerto Rico, some municipalities identified as MID are among the municipalities with greater than twenty percent (20%) of their respective populations categorized as disabled or having difficulty in at least one (1) of the six (6) categories accounted for by the U.S. Census. Those populations are identified in the **Table 16~~3~~** with bolded text. The Municipality of Guánica had a significant percentage of its population identified as having vision difficulty (40.1%), ambulatory difficulty (36.7%) and independent living difficulty (24.7%).

[20] See Puerto Rico's CDBG-MIT Action Plan Section "Additional Analysis of Demographics and Protected Classes" for detailed assessment on socially vulnerable populations and protected classes. Accessed at: https://cdbg-dr.pr.gov/en/cdbg-mit/ (English) and https://cdbg-dr.pr.gov/cdbg-mit/ (Spanish).

[21] Trieb, Carolin-Anna. *Vulnerability to Natural Hazards: A Gender Perspective in Disasters*, Management Center Innsbruck. Accesed at: http://www.ibgeographypods.org/uploads/7/6/2/2/7622863/university_dissertation_ib_dp_geography.pdf

Table15: Populations with Difficulties from 2015-2019 by Muncicipality identified as MID Areas (area as per initial allocation notice)

Municipality	Total Population (2019)	Hearing difficulty	Vision difficulty	Cognitive difficulty	Ambulatory difficulty	Self-care difficulty	Independent living difficulty
Guánica	16,280	1496 (9.19%)	**6520 (40.05%)**	2594 (15.93%)	**5968 (36.66%)**	2374 (14.58%)	**4020 (24.69%)**
Guayanilla	18,447	561 (3.04%)	621 (3.37%)	1154 (6.26%)	1771 (9.6%)	757 (4.1%)	1635 (8.86%)
Ponce	137,042	5204 (3.8%)	6158 (4.49%)	13817 (10.08%)	22549 (16.45%)	10742 (7.84%)	18510 (13.51%)
Yauco	35,264	1838 (5.21%)	**7423 (21.05%)**	4001 (11.35%)	**7587 (21.51%)**	3390 (9.61%)	6790 (19.25%)
Puerto Rico	3,293,526	161,868 (4.91%)	233,536 (7.09%)	356,484 (10.82%)	455,396 (13.83%)	196,545 (5.97%)	426,260 (12.94%)

Puerto Rico has high rates of poverty with an average of forty-three-point five percent (43.5%) of people living in poverty according to the United States Census estimates for 2019, which is significantly higher than the United States average at ten-point-five percent (10.5%). **Table 174** displays the HUD-identified MID areas, which all show a higher percentage than the Puerto Rico average, with Guánica being the highest at sixty-three-point four percent (63.4%), followed by Guayanilla with fifty-four-point eight percent (54.8%).

Table~~14~~ 1716: Percent of Persons in Poverty in HUD-identified MID Areas for Puerto Rico (area as per initial allocation notice)

Fact	United States	Puerto Rico	Ponce	Guayanilla	Yauco	Guánica
Percent of Persons in Poverty	10.50%	43.50%	**51.40%**	**54.80%**	**49.00%**	**63.40%**

UNMET NEEDS IN HUD-IDENTIFIED MID AREAS

Using data received from FEMA and SBA on May 11, 2020, HUD updated unmet needs for a select set of disasters in 2018 and 2019. Among the revised unmet needs for extraordinary circumstances, the Puerto Rico DR-4473-PR major disaster unmet needs

summary was updated as shown in **Table 18 and Table 19** below for the previously identified MID area as per 86 FR 569.

Table1817: Initial Allocation HUD-identified MID Areas' Housing Unmet Needs

HUD-identified Housing Unmet Needs on MID Areas[22] as of May 2020						
Most Impacted Area	Serious Unmet Housing Need Estimate MID	Total Any Damage	Total Serious Damage	Owner Serious Unmet Need	Renter Serious Unmet Need	Total Serious Unmet Need
Guayanilla ~~(Municipio)~~ (Municipality)	$3,607,329	1,984	92	63	13	76
Yauco ~~(Municipio)~~ (Municipality)	$9,289,370	3,203	226	124	56	180
Ponce ~~(Municipio)~~ (Municipality)	$3,291,009	1,657	83	26	48	74
Guánica ~~(Municipio)~~ (Municipality)	$13,561,198	2,898	254	176	40	216
Total Most Impacted Areas	**$29,748,906**	**9,742**	**655**	**389**	**157**	**546**

Table1918: Major-High and Severe Damage to Houses in HUD-identified MID Area (From Second Allocation)

Major-High and Severe Damage to Houses by Type and Municipality					
Municipality	**Apartment**	**Condo**	**House/Duplex**	**Townhouse**	**Grand Total**
Guánica (Municipality)			190	4	194
Guayanilla (Municipality)	1		54	1	56
Lajas (Municipality)			20		20
Peñuelas (Municipality)			20		20
Ponce (Municipality)	14	2	55	1	72
Yauco (Municipality)	1	1	107		109
Total	**16**	**3**	**497**	**0**	**522**

Table 2019: Minor-Low, Minor-High and Major-Low Damage to Houses in HUD-identified MID Area (From Second Allocation)

Minor-Low, Minor-High and Major-Low Damage to Houses by Type and Municipality								
Municipality	**Apartment**	**Assisted Living Facility**	**Condo**	**House/Duplex**	**Mobile Home**	**Other**	**Townhouse**	**Grand Total**
Guánica (Municipality)	142	2	16	2537	1		42	2740

[22] Based on HUD report on unmet needs allocations methodology as of May 11, 2020 "Allocation of CDBG–DR Funds to Most Impacted and Distressed Areas due to 2018 and 2019 Federally Declared Disasters". Information provided by HUD to PRDOH on March 3, 2021.

Minor-Low, Minor-High and Major-Low Damage to Houses by Type and Municipality								
Municipality	**Apartment**	**Assisted Living Facility**	**Condo**	**House/Duplex**	**Mobile Home**	**Other**	**Townhouse**	**Grand Total**
Guayanilla (Municipality)	73		2	1863	2		31	1971
Lajas (Municipality)	7		2	986	1		5	1001
Peñuelas (Municipality)	13			1473	1	1	23	1511
Ponce (Municipality)	605	2	234	4727			107	5675
Yauco (Municipality)	179	1	21	2902	2		44	3149

MITIGATION NEEDS ASSESSMENT

The incorporation of mitigation into the Earthquake and Storm Isaías recovery brings forth alignment in prior research conducted by the PRDOH as part of the HUD 2019 CDBG-MIT award. This can be found in the CDBG-MIT Action Plan, as amended.

A complete risk assessment has four (4) basic components, including: hazard identification; profiling of hazard events; inventory of assets; and an estimate of potential human and economic losses based on exposure and vulnerability of people, buildings, and infrastructure.[23]

In the CDBG-MIT Action Plan, the evaluation of risk is based on the Department of Homeland Security (**DHS**) extended risk definition.[24] By utilizing this definition, PRDOH determines measurable risk in as universal a language as possible, making the results accessible for planning across federal funding sources and allocations. Here, risk is the potential for an adverse outcome assessed as a function of threats, vulnerabilities, and consequences associated with an incident, event, or occurrence. The equation in **Figure 11** illustrates this concept showing that Vulnerability times Hazard times Consequence equals Risk.

$$RISK_{HAZ_n} = (VUL)(HAZ_n)(CON_{HAZ_n})$$

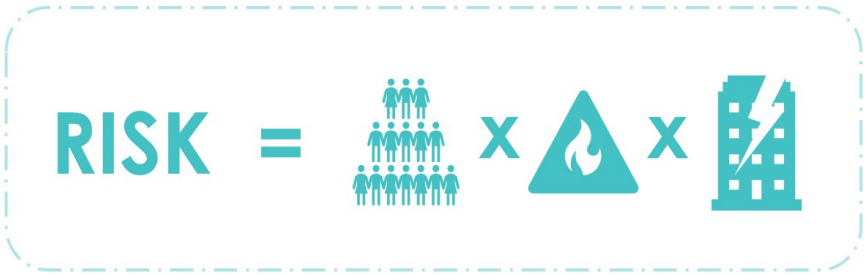


Figure 11: Risk Assessment Equation

Assessment of *Vulnerability*

To mitigate risk from any (1) one or more hazards, it is imperative to first understand what is at risk and what or who are vulnerable to the impacts. Understanding which populations and what assets are likely to be impacted by hazard events is critical for developing sound mitigation planning activities and projects. The population and assets

[23] United States. FEMA. *Hazard Mitigation Planning*. Accessed at: https://www.fema.gov/hazard-identification-and-risk-assessment.
[24] Department of Homeland Security, *DHS Risk Lexicon*. September 2008. Accessed at: https://www.dhs.gov/xlibrary/assets/dhs_risk_lexicon.pdf

considered vulnerable, to earthquake hazard, are demonstrated in the following three (3) indicators:

1. Critical lifeline[25] infrastructure assets provide a representation of what is at risk;
2. Socially vulnerable areas provide an idea of who has a lower capacity to absorb shocks and stresses; and
3. Total population supports a utilitarian approach to serving the greatest number of people.

Combining these three (3) vulnerabilities indicators into a single measure, enables an accounting of all three (3) characteristics in an empirical way. The vulnerability has been determined by developing a GIS inventory of critical infrastructure assets[26], population[27], and socially vulnerable population.

Lifeline infrastructure assets considered critical lifeline sectors include facilities for transportation, communication, water and wastewaters, and power. These facilities are most critical because all other infrastructure lifelines depend on them for stability.[28] Socially vulnerable populations have been derived from the Social Vulnerability Index (**SoVI**) first developed by Cutter (2003)[29] and later refined by scholars at the University of Central Florida.[30] Understanding where populations reside who have a reduced ability to prepare for, respond to, and recover from disaster events can help decision makers distribute scarce resources before, during, or after disasters. The population density has been derived from the HUD low- and moderate-income summary data (**LMISD**) at the block group level. Each of the three (3) components of vulnerability are applied to understand of mitigation needs with regard to Earthquakes.

Earthquakes and Associated Hazards

The PRDOH's Risk Assessment conducted during the CDBG-MIT Action Plan development process[31] included the analysis of eighteen (18) hazards, based on the common occurrence of these hazardous events in the U.S. and the likelihood of occurrence in the Caribbean. The results of this analysis reveal Puerto Rico's most threatening hazards at

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[25] Community Lifelines are defined by the Federal Emergency Management Agency (**FEMA**) as "those services that enable the continuous operation of critical government and business functions and are essential to human health and safety or economic security."[25] Lifelines are the integrated network of assets, sectors, services, and capabilities that are used day-to-day to support the recurring community needs. Lifelines also represent an organizing principal for resource allocation and prioritization during and after a disaster. See FEMA. *National Response Framework*, Fourth Edition, October 28, 2019; available at: https://www.fema.gov/sites/default/files/2020-04/NRF_FINALApproved_2011028.pdf

[26] United States. FEMA. *Community Lifelines*. Accessed at: https://www.fema.gov/lifelines

[27] Population has been calculated utilizing FY 2020 ACS 5-Year 2011-2015 Low- and Moderate-Income Summary Data Block Group data for Puerto Rico and Census TIGER/Line Shapefiles.

[28] For more information, see Lifeline Interdependency section of the CDBG-MIT Action Plan, as amended, available at: https://cdbg-dr.pr.gov/en/cdbg-mit/ (English) and https://cdbg-dr.pr.gov/cdbg-mit/ (Spanish).

[29] Cutter, Susan L., et al. *Social Vulnerability to Environmental Hazards*. Social Science Quarterly. May 2014. Accessed at: https://onlinelibrary.wiley.com/doi/abs/10.1111/1540-6237.8402002

[30] https://www.vulnerabilitymap.org/

[31] Risk Assessment submitted to HUD on December 4, 2020, included a thorough assessment with four (4) components, including: hazard identification; profiling of hazard events; inventory of assets; and an estimate of potential human and economic losses based on exposure and vulnerability of people, buildings, and infrastructure. More information on the assessment can be found in the July 2020 Report *Puerto Rico's Hazard Risk Assessment,* included in the CDBG-MIT Action Plan as Appendix A.

the state-wide (or Island-wide level), which are ranked. **Figure 12** illustrates that earthquake is the third highest risk overall for the archipelago of Puerto Rico.

The risk assessment information has been made available to the public at the Island-wide and municipal level through the release of an interactive dashboard, with granular information up to a half-mile hexagonal grid level.[32]

1	Hurricane Force Winds
2	Flood (100-year)
3	Earthquake
4	Landslide
5	Liquefaction
6	Drought
7	Severe Storm
8	Sea Level Rise (10 ft)
9	Wildfire
10	Human Hazard
11	Fog
12	Lightning
13	Category 5 Storm Surge
14	Tornado
15	Tsunami
16	Wind
17	Hail
18	High Temp

Figure 1212: Risk Assessment Results at Island-Wide Level

[32] Puerto Rico Hazards and Risks Dashboard found at: https://cdbg-dr.pr.gov/iframes/PRhazardandrisksIFRM

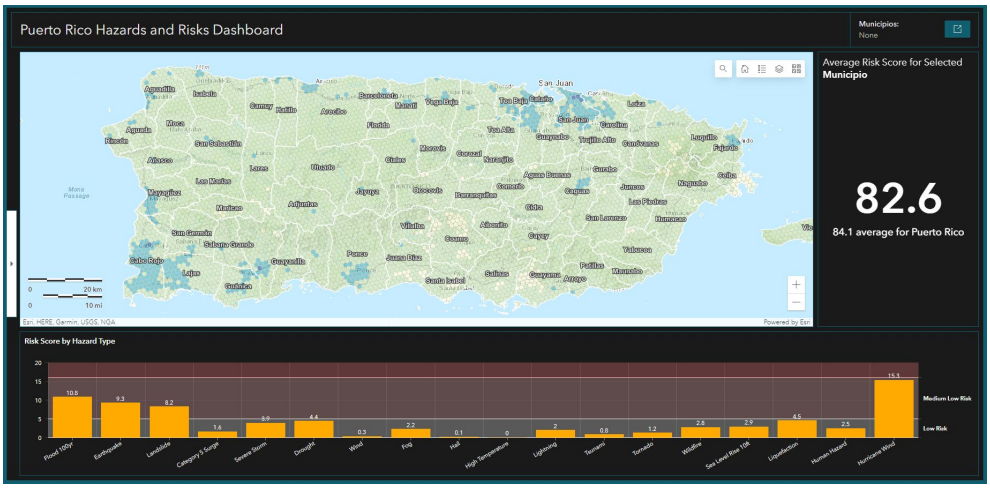


Figure 13: 13: Puerto Rico Hazards and Risk Dashboard

Risk Assessment results for the Disaster Impacted Areas (DR-4473-PR and DR-4560-PR)

Applying the definition of risk and adhering to the methodology established in the CDBG-MIT Action Plan, PRDOH applies the assessment of vulnerability according to the indicators profiled herein.

Vulnerability In the Disaster Impacted Areas

In alignment with this methodology, earthquake hazard vulnerability is determined with the following indicators: infrastructure density, social vulnerability, and population. Infrastructure locations and density show the critical assets at risk, while the area with the highest social vulnerability identifies those areas where the persons have a lower capacity to absorb shocks and stressors, and the total population counts allow for higher risk to be tied to locations where the greatest number of people live.

In **Figure 14**, the density of critical infrastructure with the DR-4473 and DR-4560 combined area of impact depicts a particularly high cluster of infrastructure in the municipalities of Mayagüez, Ponce, and Arecibo, as well as other areas. Critical lifeline infrastructure locations are captured and mapped using either point features (individual locations) or line features (sets of point features) depending on the infrastructure asset. For example, electric generation facilities would be represented by a point, while electrical transmission lines would be represented as line features inside a GIS system. For this assessment, line feature classes representing critical infrastructure were converted to point feature classes using the ESRI ArcGIS Pro Generate Points Along Lines tool generating a point at each endpoint and every 200 meters along the line feature. Critical infrastructure point data and point data generated from the line features were then merged to create one (1) complete point feature representation of critical infrastructure. This point data was then geo-processed with the ESRI ArcGIS Pro Summarize Within tool to generate a count of points within each 0.5-square-mile hex grid. Critical lifeline

infrastructure counts were then classified using an equal interval classifications scheme and mapped using the same output hex grid as hazard threat maps.

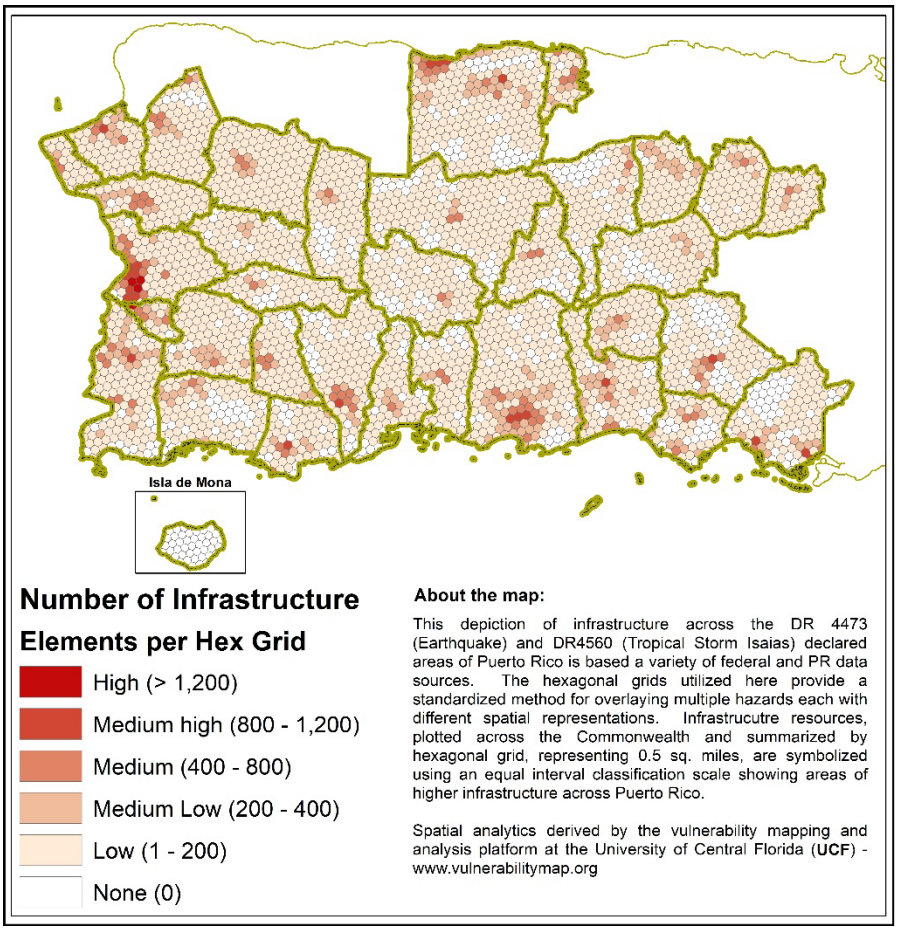


Figure 14: Infrastructure Assets

The following table contains an analysis of infrastructure by risk category in the impacted area.

Risk Category (low to high)	Total count of hex grids	Total Infrastructure in Risk Category
1	70	2
2	1471	16039
3	1598	45536
4	461	39460
5	467	78663

Table 2120: Infrastructure by risk category

In **Figure 15**, the map of population density is based on the population data collected from the American Community Survey products developed for HUD's LMISD block group

dataset at the block group level.[33] This population data was geo-processed with the ESRI ArcGIS Pro Create Random Points tool to randomly distribute the population (Low-Moderate Universe). Similar to critical infrastructure, this population data was geo-processed with the ESRI ArcGIS Pro-Summarize Within tool, to generate a count of points within each 0.5-square-mile hex grid. The population per hex grid was classified on a quasi-exponential classification scale, showing areas with higher populations across the area of impact.

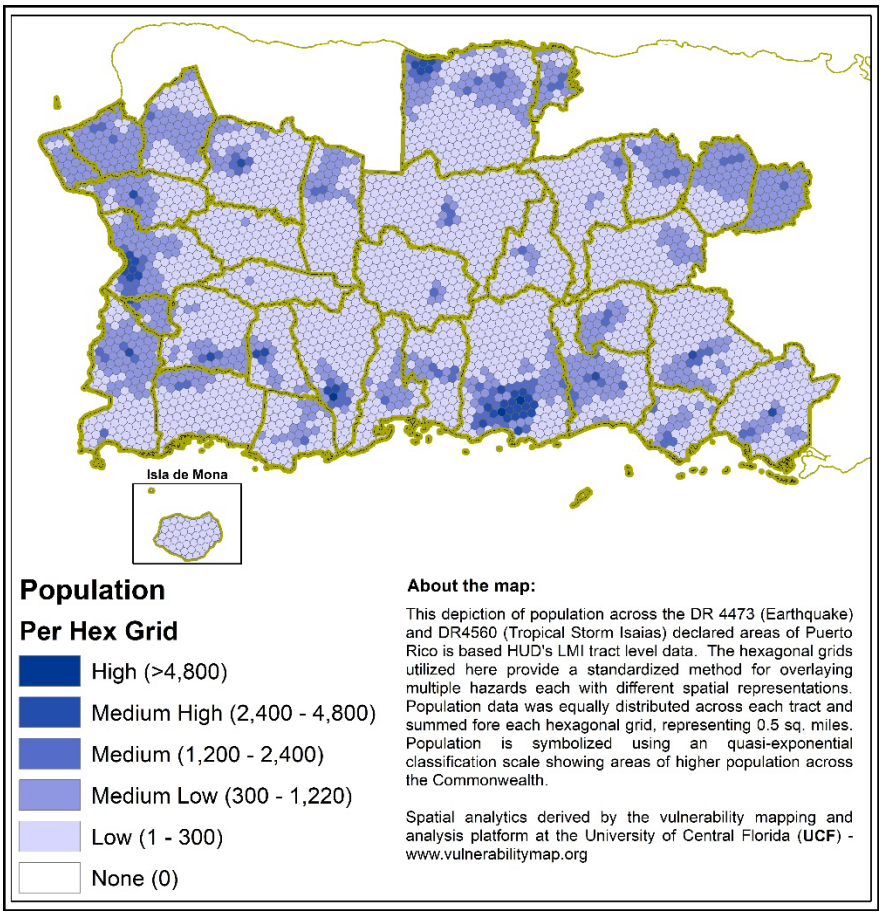


Figure 15: Population Count

The following table contains an analysis of population by risk category in the impacted area.

Risk Category (low to high)	Total count of hex grids	Total Population in Risk Category

[33] United States. HUD. *LMISD- All Block Groups, Based on 2011-2015 ACS*. Accessed at: https://www.hudexchange.info/programs/acs-low-mod-summary-data/acs-low-mod-summary-data-block-groups-places/

1	70	1423
2	1471	176599
3	1598	442199
4	461	208357
5	467	352567

Table 2221: Population by risk category

In **Figure 16**, indicators of social vulnerability were used to create a SoVI for Puerto Rico. SoVI scores were categorized from (0 – no data to 5 – high social vulnerability) using a standard deviation classification scheme.

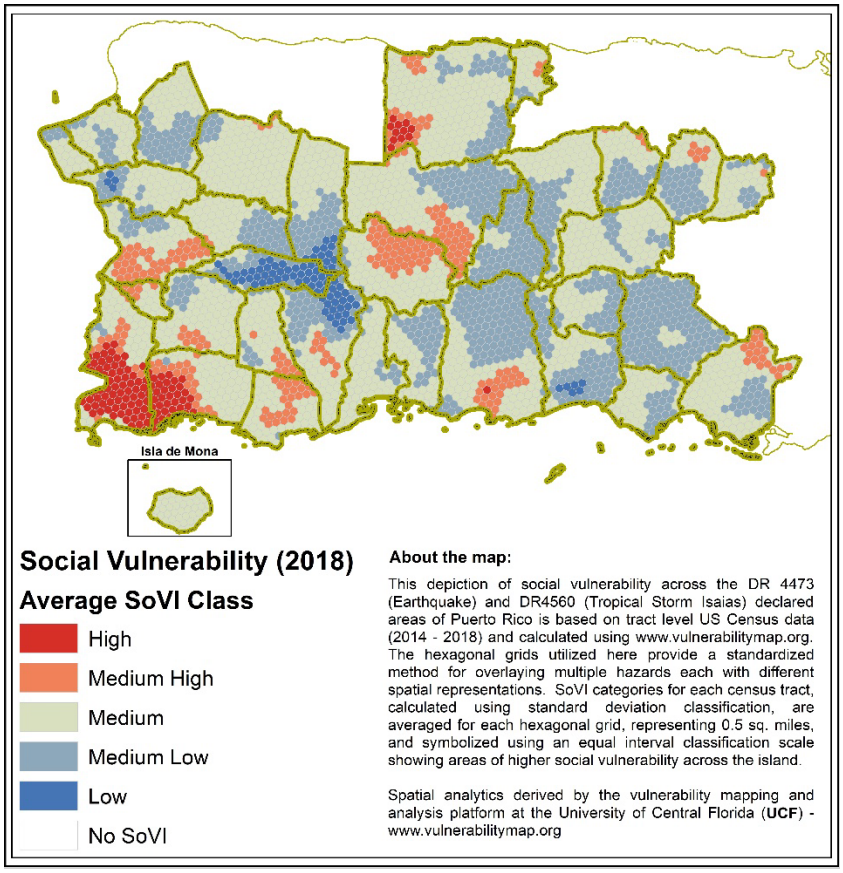


Figure 14: Social Vulnerability Analysis, 2018 SoVi

The following table contains an analysis of SoVI by risk category in the impacted area.

Risk Category (low to high)	Total count of hex grids	Total Population in Medium, High, and High SoVI areas
2	27	2512
3	236	39939

4	80	31850
5	148	160083

Table 15. SoVI Analysis Results by Risk Category

Social vulnerability describes an area's capacity to prepare for, respond to, and rebound from disaster events[34], and has a long conceptual and theoretical history in social and disaster science fields.[35] Socially vulnerable populations have fewer resources to aid in preparation for disasters, often bear the brunt of disaster impacts, and take longer to bounce back from disaster events. Empirical measures of social vulnerability enable decision makers and emergency managers to understand where vulnerable populations reside and how that vulnerability manifests across a landscape. The twenty-nine (29) criteria utilized for this analysis are described in the table below.[36]

Social Vulnerability Index Factors		
Variable	**Description**	**Pillar**
1	Percent Civilian Unemployment	Employment Structure
2	Percent Employment in Extractive Industries	Employment Structure
3	Percent Employment in Service Industry	Employment Structure
4	Percent Female Participation in Labor Force	Employment Structure
5	Percent Renters	Housing
6	Percent Mobile Homes	Housing
7	Percent Unoccupied Housing Units	Housing
8	Percent Population under 5 years or 65 and over*	Population structure
9	Percent of Children Living in 2-parent families	Population structure
10	Median Age	Population structure
11	Percent Female*	Population structure
12	Percent Female Headed Households*	Population structure
13	People per Unit	Population structure
14	Percent Asian*	Race/Ethnicity

[34] Cutter, Susan L., Emrich, Christopher T. Moral Hazard, Social Catastrophe: The Changing Face of Vulnerability along the Hurricane Coasts. The ANNALS of the American Academy of Political and Social Science. March 1, 2006. Accessed at: https://journals.sagepub.com/doi/10.1177/0002716205285515.
[35] Birkmann, Jörn. Measuring Vulnerability to Natural Hazards: Towards Disaster Resilient Societies Second Edition. United National University Press. December 2013.
[36] Additional information about SoVI criteria can be found at www.vulnerabilitymap.org.

Social Vulnerability Index Factors		
Variable	**Description**	**Pillar**
15	Percent Black*	Race/Ethnicity
16	Percent Hispanic*	Race/Ethnicity
17	Percent Native American*	Race/Ethnicity
18	Percent Poverty	Socioeconomic Status
19	Percent Households Earning over $200,000 annually	Socioeconomic Status
20	Per Capita Income	Socioeconomic Status
21	Percent with Less than 12th Grade Education	Socioeconomic Status
22	Median Housing Value	Socioeconomic Status
23	Median Gross Rent	Socioeconomic Status
24	Percent of households spending more than 40% of their income on rent or mortgage	Socioeconomic Status
25	Percent Households Receiving Social Security Benefits*	Special Needs
26	Percent Speaking English as a Second Language with Limited English Proficiency	Special Needs
27	Nursing Home Residents Per Capita	Special Needs
28	Percent of population without health insurance	Special Needs
29	Percent of Housing Units with No Car	Special Needs

**** indicates a characteristic tied to a protected class under The Civil Rights Act of 1991 (Pub. L. 102-166).***[37]

Table 24: Social Vulnerability Factors

ASSESSMENT OF HAZARD

A rigorous geospatial approach and a deep understanding of hazards geography are utilized in the following analytics and associated results.

[37] In addition to considering protected class individuals in the SoVI analysis, PRDOH will also consider during implementation how assistance impacts beneficiaries that are classified as a protected class and shall consider HUD resources on racially and ethnically concentrated areas of poverty as published here: https://hudgis-hud.opendata.arcgis.com/datasets/56de4edea8264fe5a344da9811ef5d6e_0?geometry=-68.905%2C17.630%2C-64.845%2C18.544

100-year Flooding

Hazard Overview

Flooding is the most frequent and costly natural hazard in the United States. Floods are generally the result of excessive precipitation and can be classified under two (2) categories: flash floods, the product of heavy localized precipitation in a short time period over a given location; and general floods, caused by precipitation over a longer time period and over a given river basin. The severity of a flooding event is determined by a combination of stream and river basin topography and physiography, precipitation and weather patterns, recent soil moisture conditions and the degree of vegetative clearing. Flash flooding events usually occur within minutes or hours of heavy amounts of rainfall, from a dam or levee failure, or from a sudden release of water held by an ice jam. Most flash flooding is caused by slow-moving thunderstorms in a local area or by heavy rains associated with hurricanes and tropical storms. Although flash flooding occurs often along mountain streams, it is also common in urbanized areas where much of the ground is covered by impervious surfaces. General floods are usually longer-term events and may last for several days. The primary types of general flooding include riverine flooding, coastal flooding and urban flooding. Riverine flooding is a function of excessive precipitation levels and water runoff volumes within the watershed of a stream or river. Coastal flooding is typically a result of storm surge, wind-driven waves, and heavy rainfall produced by hurricanes, tropical storms, and other large coastal storms. Urban flooding occurs where man-made development has obstructed the natural flow of water and/or decreased the ability of natural groundcover to absorb and retain surface water runoff.

Data and Methods

FEMA provides a national flood hazard dataset for the U.S. through an online Map Service Center (**MSC**). Accordingly, the entire U.S. Special Flood Hazard Area (**SFHA**) dataset was downloaded, which represents flood hazards with a 0.01 probability of occurrence in any given year, commonly referred to as a 100-year flood or the one percent (1%) annual chance of flooding. Though additional flood zones exist for many locations in the U.S., depicting the 0.002 chance (500-year) of flooding or areas that may experience high velocity floodwater flows, we utilize only the 100-year SFHA data in our composite hazard analysis. In the case of Puerto Rico, Preliminary 100-year Flood Zones, provided by PRPB, were spatially intersected with Puerto Rico's 0.5-square-mile hexagonal grid to produce a spatial representation of flood hazard across the Island.

Hazard Frequency Analysis Results

Hurricanes and tropical storms are the most common natural hazard in Puerto Rico, causing extensive damage and loss. Hurricanes are tropical weather systems with a higher intensity of sustained winds at seventy-four (74) miles per hour ~~mph~~ or greater. They

develop over warm waters and are caused by the instability created by the collision of warm and cool air. A hurricane is a type of tropical cyclone. Tropical cyclones are classified according to the intensity of their sustained winds, namely:

1. Tropical Depression: An organized system of clouds with a defined circulation and maximum sustained winds which are less than thirty-nine (39) miles per hour. It is considered a tropical cyclone in its formative stage.
2. Tropical Storm: An organized system of clouds with a defined circulation and maximum sustained winds that fluctuate between thirty-nine (39) and seventy-three (73) miles per hour.
3. Hurricane: A maximum intensity tropical cyclone at which the maximum sustained winds reach or exceed seventy-four (74) miles per hour. It has a definite center with a very low barometric pressure in it. Hurricanes are classified into categories ranging from one (1) to five (5), and winds can reach over 155 miles per hour.

Hurricanes are dangerous because of their potential for destruction, their ability to affect large areas, their ability to form spontaneously, and their unpredictable movement. Hurricanes are often accompanied by high tides, storm surges, and heavy rains that can cause landslides and flooding by swollen rivers.

As an emerging hurricane develops, barometric pressure at its center falls and winds increase. If the atmospheric and oceanic conditions are favorable, it can intensify into a tropical depression. When maximum sustained winds reach or exceed thirty-nine (39) miles per hour, the system is designated a tropical storm, given a name and closely monitored by the National Hurricane Center in Miami, Florida. When sustained winds reach or exceed seventy-four (74) miles per hour, the storm is deemed a hurricane. Hurricane intensity is further classified by the Saffir-Simpson Scale, which rates hurricane intensity on a scale of one (1) to five (5), with five (5) being the most intense. The Saffir-Simpson hurricane wind scale[38] categorizes hurricane intensity linearly based upon maximum sustained winds, barometric pressure and storm surge potential, which are combined to estimate potential damage.

[38] United States, NOAA. *National Hurricane Center and Central Pacific Hurricane Center*. Accessed at: https://www.nhc.noaa.gov/aboutsshws.php

Category	Sustained Winds	Types of Damage Due to Hurricane Winds
1	74-95 mph 64-82 kt 119-153 km/h	**Very dangerous winds will produce some damage:** Well-constructed frame homes could have damage to roof, shingles, vinyl siding and gutters. Large branches of trees will snap and shallowly rooted trees may be toppled. Extensive damage to power lines and poles likely will result in power outages that could last a few to several days.
2	96-110 mph 83-95 kt 154-177 km/h	**Extremely dangerous winds will cause extensive damage:** Well-constructed frame homes could sustain major roof and siding damage. Many shallowly rooted trees will be snapped or uprooted and block numerous roads. Near-total power loss is expected with outages that could last from several days to weeks.
3 (major)	111-129 mph 96-112 kt 178-208 km/h	**Devastating damage will occur:** Well-built framed homes may incur major damage or removal of roof decking and gable ends. Many trees will be snapped or uprooted, blocking numerous roads. Electricity and water will be unavailable for several days to weeks after the storm passes.
4 (major)	130-156 mph 113-136 kt 209-251 km/h	**Catastrophic damage will occur:** Well-built framed homes can sustain severe damage with loss of most of the roof structure and/or some exterior walls. Most trees will be snapped or uprooted and power poles downed. Fallen trees and power poles will isolate residential areas. Power outages will last weeks to possibly months. Most of the area will be uninhabitable for weeks or months.
5 (major)	157 mph or higher 137 kt or higher 252 km/h or higher	**Catastrophic damage will occur:** A high percentage of framed homes will be destroyed, with total roof failure and wall collapse. Fallen trees and power poles will isolate residential areas. Power outages will last for weeks to possibly months. Most of the area will be uninhabitable for weeks or months.

Figure 17: Saffir-Simpson Hurricane Wind Scale. Source: NOAA

Categories three to five (3 – 5) hurricanes are classified as "major hurricanes", and while hurricanes within this range comprise only twenty percent (20%) of U.S. total tropical cyclone landfalls, they account for over seventy percent (70%) of the damage in the U.S. Damage during hurricanes may also result from spawned tornadoes and inland flooding associated with heavy rainfall that usually accompanies these storms.

Data and Methods

Gaining perspective on historical frequencies of sustained hurricane-force wind speeds across Puerto Rico required a multi-step geospatial process. First, we downloaded Extended Best Track (**EBT**) data for all Atlantic tropical cyclones from the National Hurricane Center.[39] The National Hurricane Center (**NHC**) maintains a climatology of all Atlantic tropical cyclones since 1851, called HURDAT.[40] For each storm, HURDAT contains estimates of the latitude, longitude, one (1)-minute maximum sustained surface winds, minimum sea-level pressure, and an indicator of whether the system was purely tropical, subtropical, or extra-tropical, at six (6)-hour intervals. However, HURDAT lacks any information about storm structure. By supplementing HURDAT with additional storm parameters determined by NHC, we created the "extended" best track file. The additional parameters include the following:

1. The maximum radial extent of thirty-four (34), fifty (50) and sixty-four (64) kt wind in four (4) quadrants
2. The radius of maximum wind
3. Eye diameter (if available)
4. Pressure and radius of the outer closed isobar

[39] United States. Department of Commerce. Extended Best Track Dataset. Accessed at http://rammb.cira.colostate.edu/research/tropical_cyclones/tc_extended_best_track_dataset/

[40] HURDAT is a commonly used acronym that stands for the North Atlantic Hurricane Dataset.

This EBT data was subset for Puerto Rico, resulting in a set of more than 624 six (6)-hour locations for seventy-seven (77) tropical cyclones close enough to Puerto Rico to impact the Island with winds (see upper left quadrant of **Figure 18**) between 1988–2018. The radius to maximum winds for each point was used to create a buffer around each point showing the most likely hurricane wind field. This fan-shaped buffer (see upper right quadrant of **Figure 18**), created specifically for this assessment, accounts for the general movement of hurricanes in this part of the Caribbean. Because most hurricanes travel in an East–West or Southeast–Northwest tract, compared to the more North-South pattern seen in the Southeastern U.S., the resulting winds associated with these storms are not on the east side of the storm generally, but rather on the northeast. Each of the wind fields is then summarized to recreate a specific wind zone polygon for each hurricane event (see bottom left quadrant of **Figure 18**) so that each storm is only counted once in the analytic process. Finally, a sum of the number of hurricanes impacted Puerto Rico between 1988–2018 is generated for each hex grid and summarized by municipalities (see lower right quadrant of **Figure 18**).

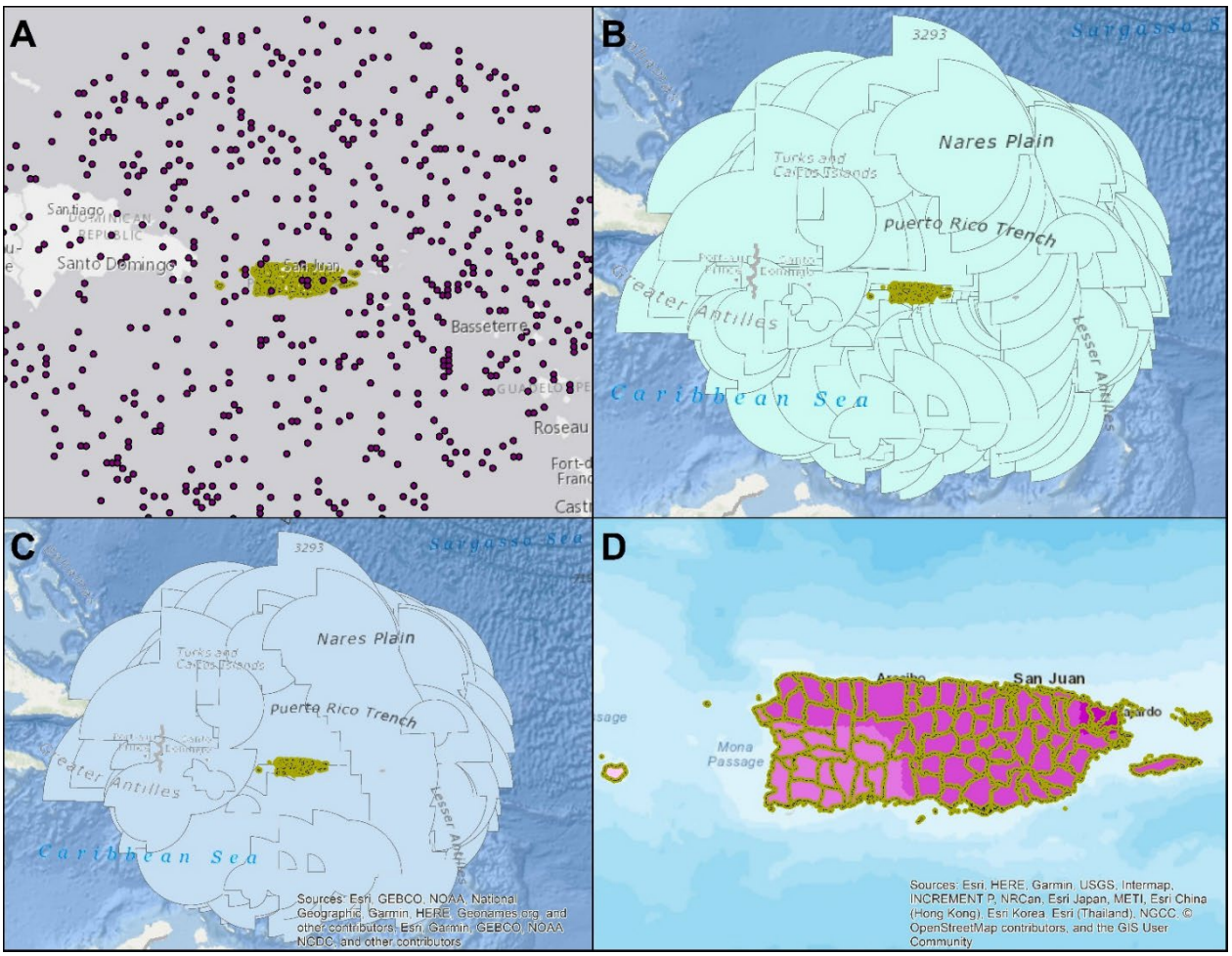


Figure 18: Hurricane Wind Hazard Frequency Analysis Process

Hazard Frequency Analysis Results

Figure 19 demonstrates the risk of hurricane force wind in the impacted areas.

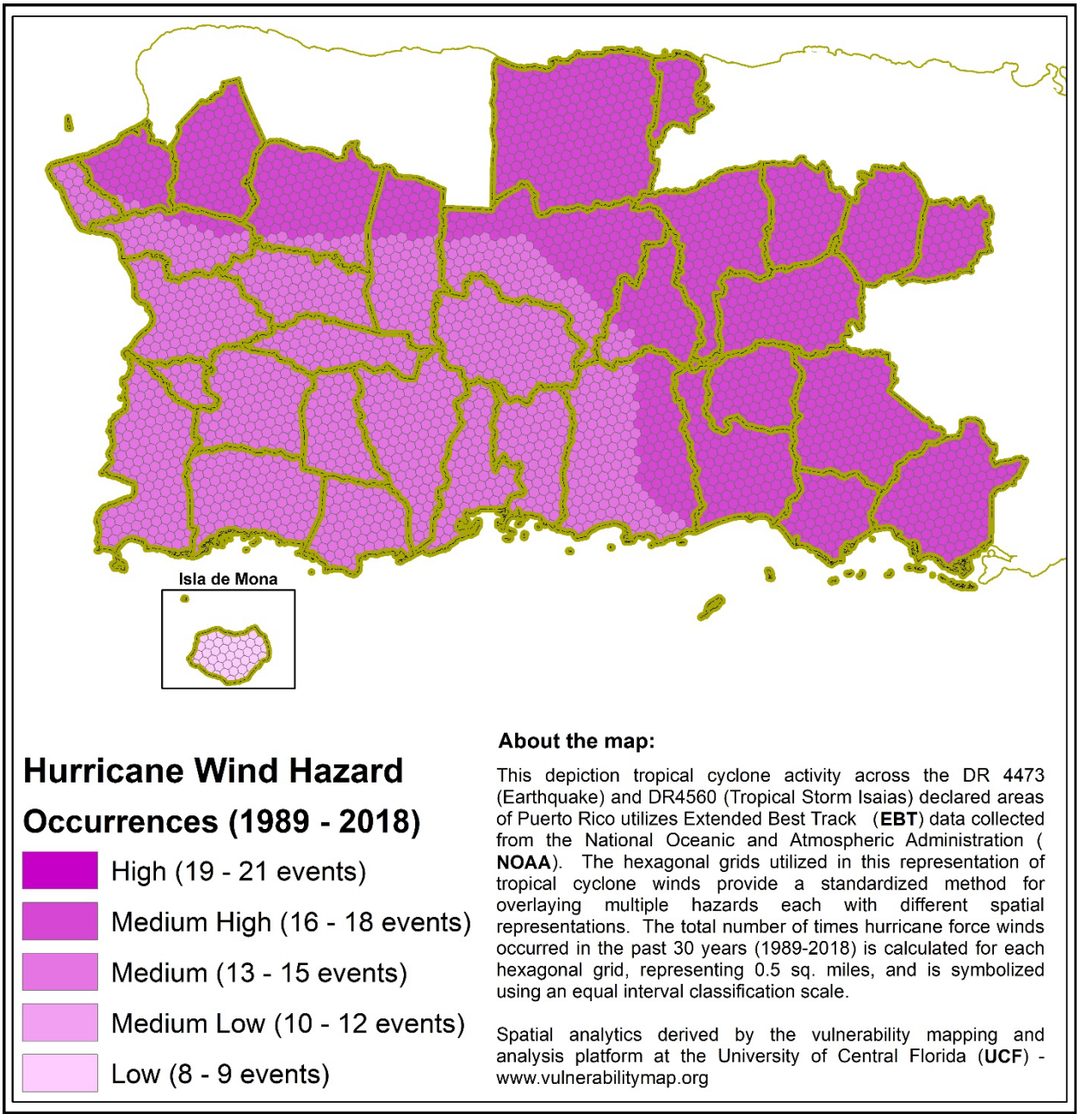


Figure 19: Hurricane Wind Hazard

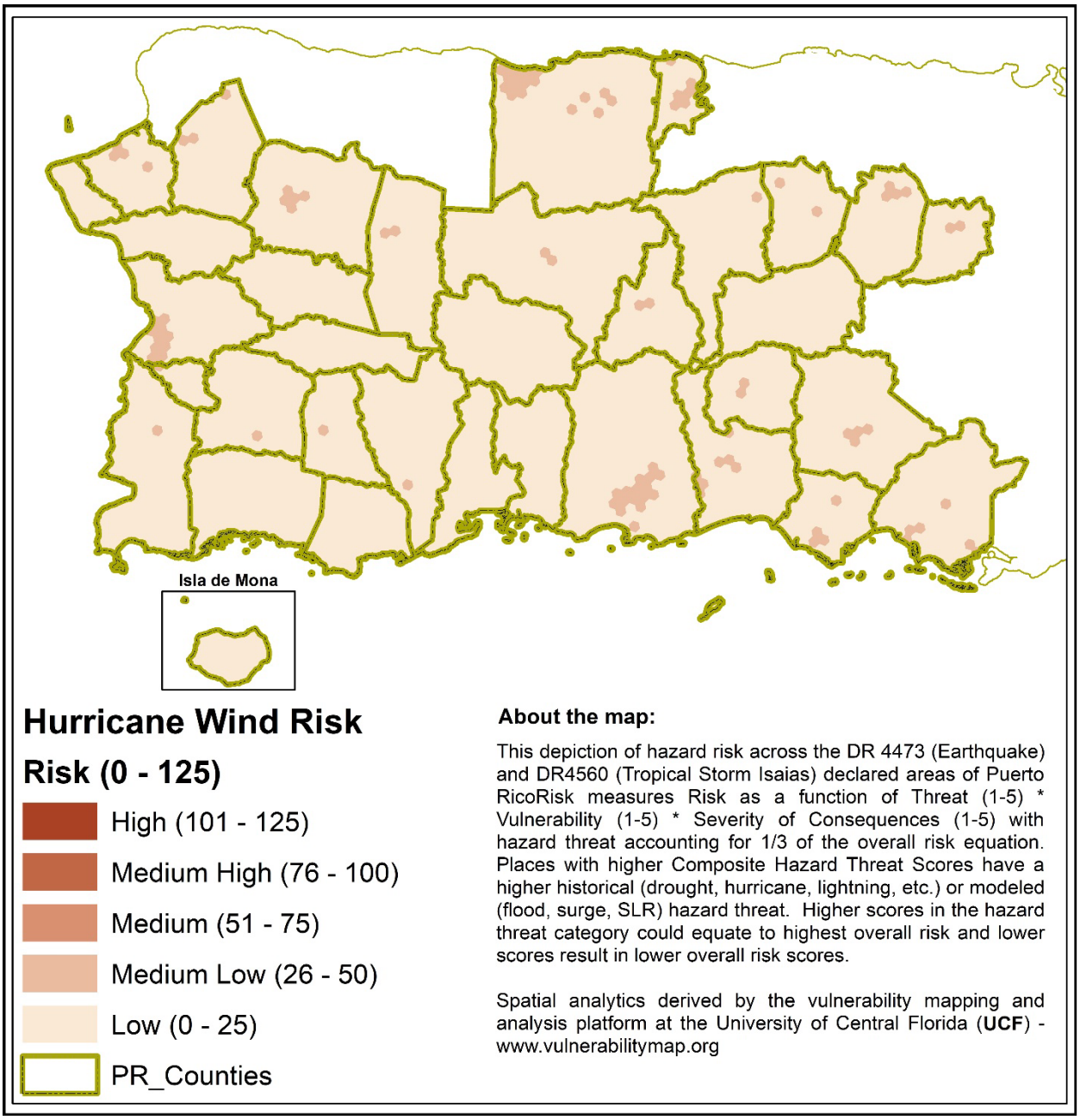


Figure 20. Hurricane Wind Risk

100-year Flooding

Hazard Overview

Flooding is the most frequent and costly natural hazard in the United States. Floods are generally the result of excessive precipitation and can be classified under two (2) categories: flash floods, the product of heavy localized precipitation in a short time period over a given location; and general floods, caused by precipitation over a longer time period and over a given river basin. The severity of a flooding event is determined

by a combination of stream and river basin topography and physiography, precipitation and weather patterns, recent soil moisture conditions and the degree of vegetative clearing. Flash flooding events usually occur within minutes or hours of heavy amounts of rainfall, from a dam or levee failure, or from a sudden release of water held by an ice jam. Most flash flooding is caused by slow-moving thunderstorms in a local area or by heavy rains associated with hurricanes and tropical storms. Although flash flooding occurs often along mountain streams, it is also common in urbanized areas where much of the ground is covered by impervious surfaces. General floods are usually longer-term events and may last for several days. The primary types of general flooding include riverine flooding, coastal flooding and urban flooding. Riverine flooding is a function of excessive precipitation levels and water runoff volumes within the watershed of a stream or river. Coastal flooding is typically a result of storm surge, wind-driven waves, and heavy rainfall produced by hurricanes, tropical storms, and other large coastal storms. Urban flooding occurs where man-made development has obstructed the natural flow of water and/or decreased the ability of natural groundcover to absorb and retain surface water runoff.

Data and Methods

FEMA provides a national flood hazard dataset for the U.S. through an online Map Service Center (**MSC**). Accordingly, the entire U.S. Special Flood Hazard Area (**SFHA**) dataset was downloaded, which represents flood hazards with a 0.01 probability of occurrence in any given year, commonly referred to as a 100-year flood or the one percent (1%) annual chance of flooding. Though additional flood zones exist for many locations in the U.S., depicting the 0.002 chance (500-year) of flooding or areas that may experience high velocity floodwater flows, we utilize only the 100-year SFHA data in our composite hazard analysis. In the case of Puerto Rico, Preliminary 100-year Flood Zones, provided by PRPB, were spatially intersected with Puerto Rico's 0.5-square-mile hexagonal grid to produce a spatial representation of flood hazard across the Island.

Hazard Frequency Analysis Results

Figure 21 and **Figure 22** illustrate the assessment results for the impacted area.

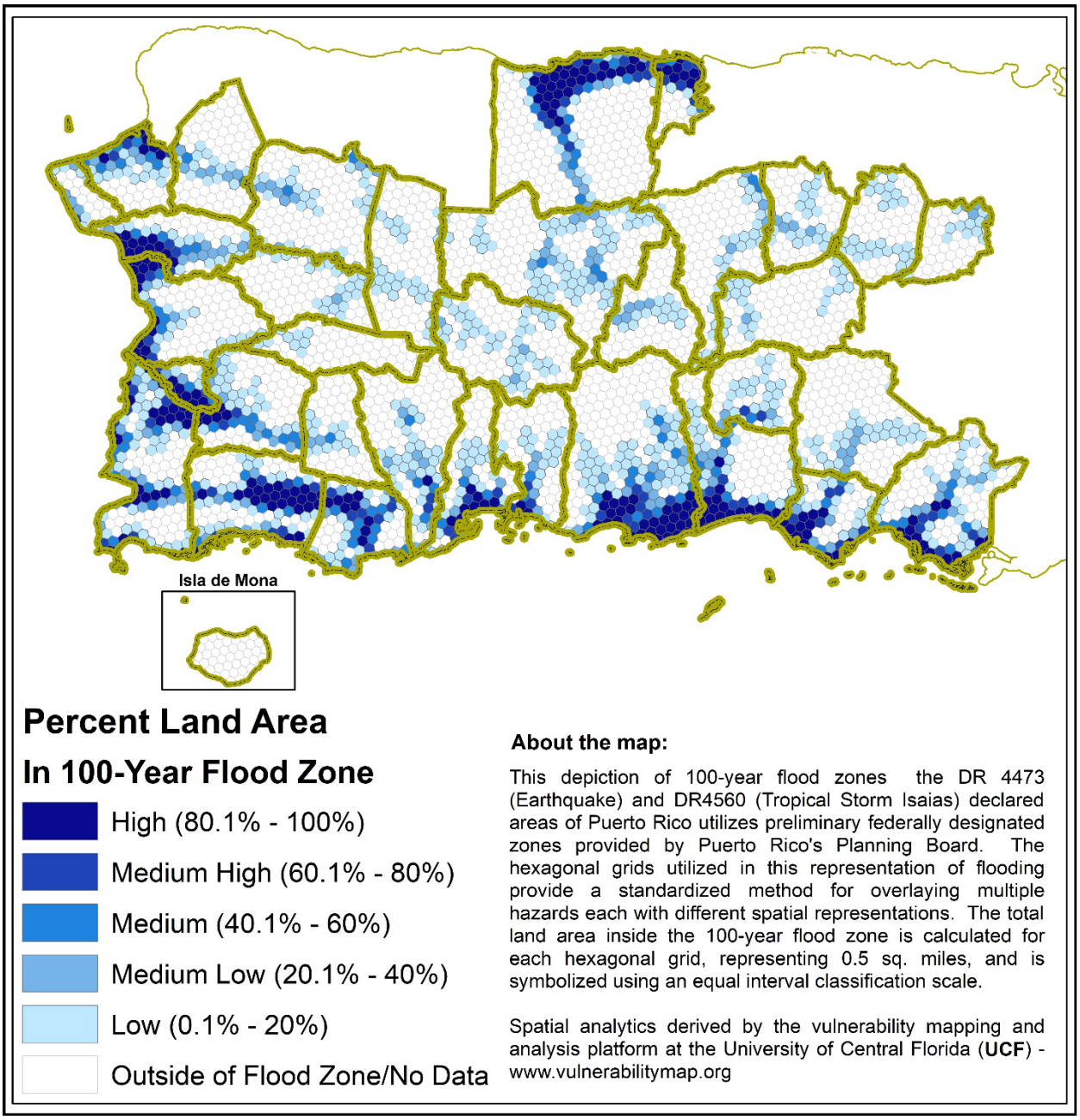


Figure 21: 100-year Flood Hazard

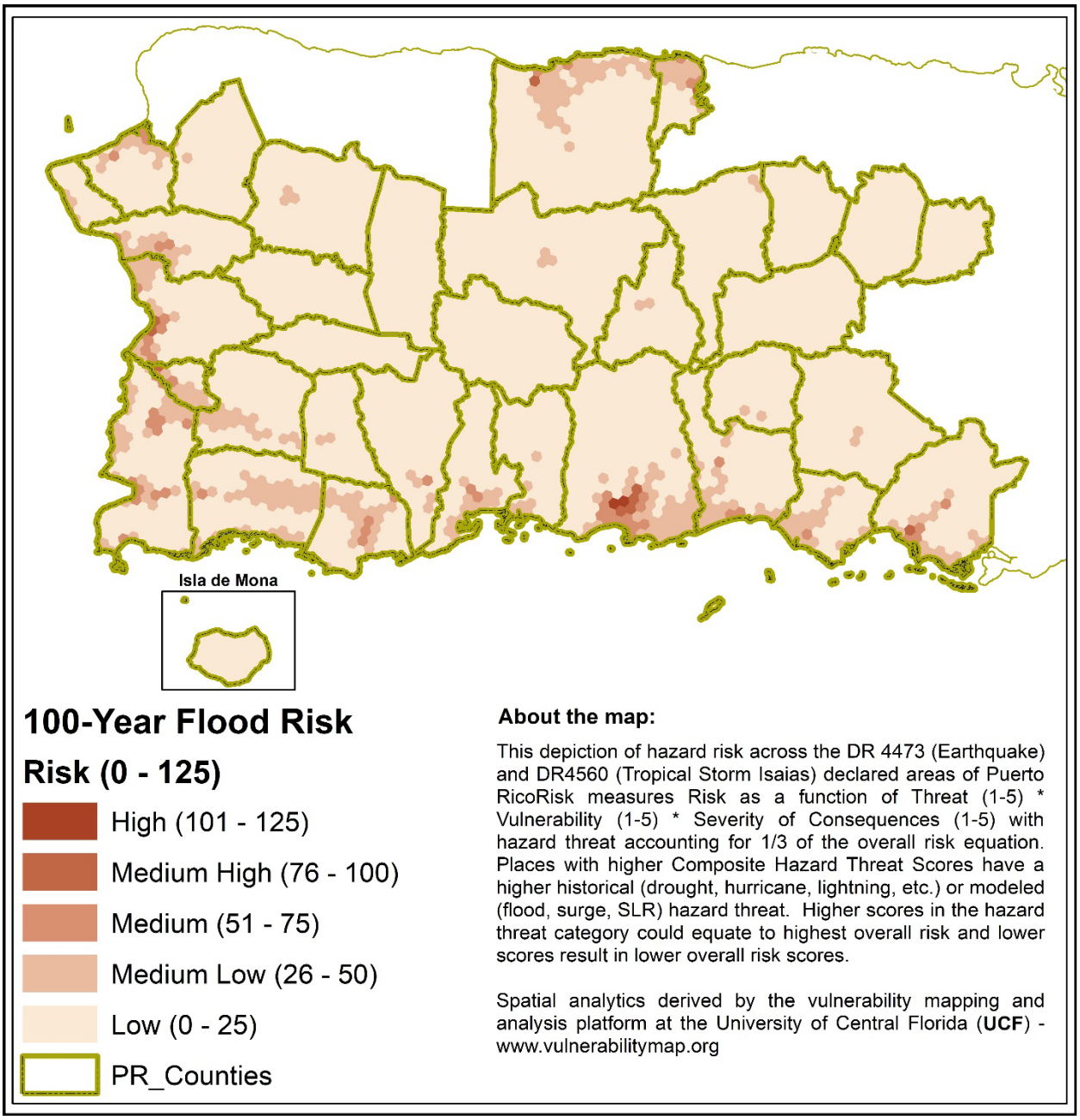


Figure 22:100-Year Flood Risk in Impacted Area

Liquefaction

Hazard Overview

Liquefaction is a phenomenon causing unconsolidated soils to lose strength and act similar to viscous fluid when subjected to earthquake ground shaking. Liquefaction can result in subsidence of land during an earthquake event. Liquefaction frequency and

intensity is based on several factors, including the geologic conditions of the area, groundwater depth, ground shaking intensity, and the magnitude of the earthquake.[41]

Data and Methods

Universidad Metropolitana (**UMET**), in partnership with URS Corporation, completed an integrated hazard assessment for Puerto Rico (2002). One output of this work was an assessment of liquefaction-induced ground failure potential hazard zones across most of Puerto Rico (excluding Vieques, Culebra, and Isla de Mona). Relative liquefaction susceptibility was characterized by evaluating soil/geologic conditions and groundwater depth. Based on these characteristics, a relative liquefaction susceptibility rating (e.g., very low to very high) was assigned based on classification systems established by Youd and Perkins (1978).[42] Sandy soils with shallower water tables, present a greater liquefaction threat than rock or rock-like materials which were considered low liquefaction hazards. These zones, originally created for each municipality, were combined and mapped using the same classification system as in the initial assessment.

Hazard Frequency Analysis Results

Figure 23 demonstrates the results of this analysis in the impacted area.

[41] Geoinformatica, Inc., Accessed at: http://www.geopr.org/free-data.html.
[42] Youd, Leslie, ASCE, M. Perkins, David M. *Mapping Liquefaction-Induced Ground Failure Potential*, Journal of the Geotechnical Engineering Division. April 1978. Accessed at: https://www.researchgate.net/publication/279600523_Mapping_liquefaction-induced_ground_failure_potential.

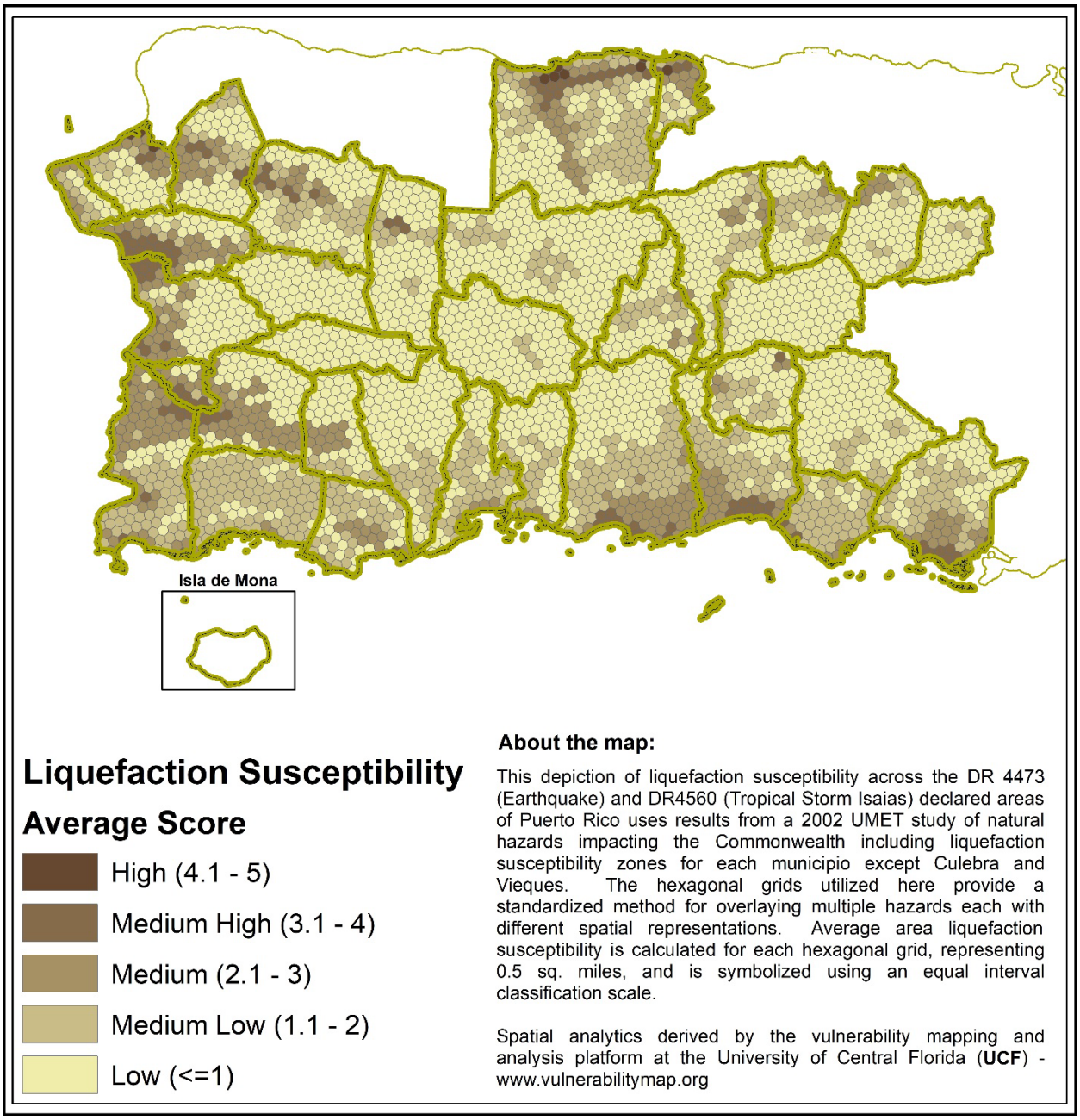


Figure 23: Liquefaction Susceptibility

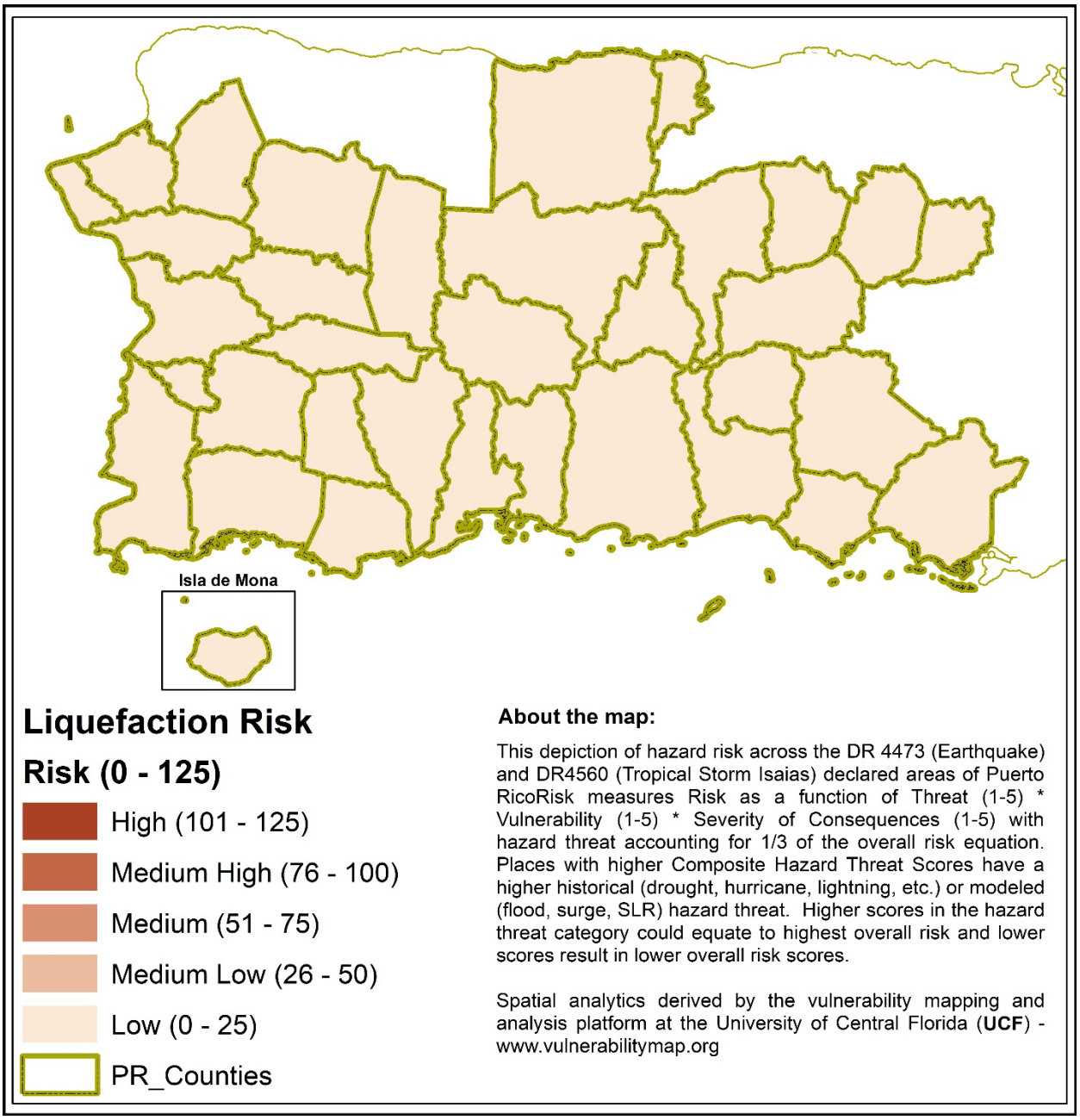


Figure 24: Liquifaction Risk

Rain Induced Landslides

Hazard Overview

According to the Puerto Rico's SHMP[43], landslides occur when the force of gravity exerts its influence on crustal materials. The term landslide includes a wide variety of land movements, such as rockfalls, slope failures, and debris flow. This earth movement

[43] *2016 Puerto Rico Hazard Mitigation Plan*. Accessed under file name "Puerto Rico Plan de Mitigación-Aprobado 02/08/2016" at the following website location: https://recovery.pr/en/document-library.

threatens life and property and can disrupt transit, dragging trees, houses, bridges and cars, among others.

Meteorological phenomena that cause intense and prolonged rainfall, such as tropical waves and tropical cyclones can trigger landslides. Population growth and/or migration and poor construction exacerbates the susceptibility of Puerto Rico to experience landslides.

Among the many factors causing ~~the formation of~~ landslides, the most important are soil type, slope or incline of the terrain, soil water saturation, erosion, the presence of depressions or cavities, human activities, and of course the occurrence of earthquakes. As stated in the Building Performance Assessment Team Report (**BPAT**) prepared after Hurricane Georges, "landslides will become a major problem in the future as more houses are built and there is more development in areas susceptible to these risks" (FEMA, March 1999).

As introduced in the 2016 SHMP, many of the landslides that occur in Puerto Rico are in a special category known as "debris flow". The flow occurs in mountainous areas with significant slopes during heavy rains. The rain saturates the soil and causes the ground level and peel strength loss, usually where the ground makes contact with the bedrock. There are many types of landslides, however, associated with soil saturation by water:

1. Slow landslides: slow and steady movement of soil or rock falls down the slope, often recognized by their content of tree trunks, twisted pieces of fences or retaining walls, tilted poles or fences.
2. Debris flow: fast-moving mass which combines loose soils, rocks, organic matter, air infiltration, and water to form a viscous flow that slides down the slope.
3. Debris avalanche: fast, or extremely fast, debris flow range.
4. Mud flow: the mass rapid flow of wet material containing at least fifty percent (50%) sand, silt and clay particles.

Data and Methods

The USGS completed a study of rainfall-induced landslides on Puerto Rico in early 2020.[44] The report summarizes creation of a new high-resolution model of rainfall-induced landslide susceptibility for the main Island. The main Island of Puerto Rico was classified at five (5) meter pixel scale into categories of Low, Moderate, High, Very High, or Extremely High susceptibility to land sliding during and soon after intense rainfall, such as is produced during tropical cyclones. Resulting raster GIS output data, downloaded as georeferenced files, were used in this assessment to understand sub-municipal-level landslide susceptibility. The output grid of susceptibility index (**SI**) values was summarized for each 0.5-square-mile hexagonal grid, and a focus on average landslide values was

[44] United States. USGS. *Map Depicting Susceptibility to Landslides Triggered by Intense Rainfall, Puerto Rico*. Accessed on June 2020 at https://pubs.er.usgs.gov/publication/ofr20201022

generated. Average SI values were used here because they provide suitable geospatial variability across Puerto Rico, whereas summarized maximum SI values skew the visualization towards a much less realistic landslide threat (see maps below).

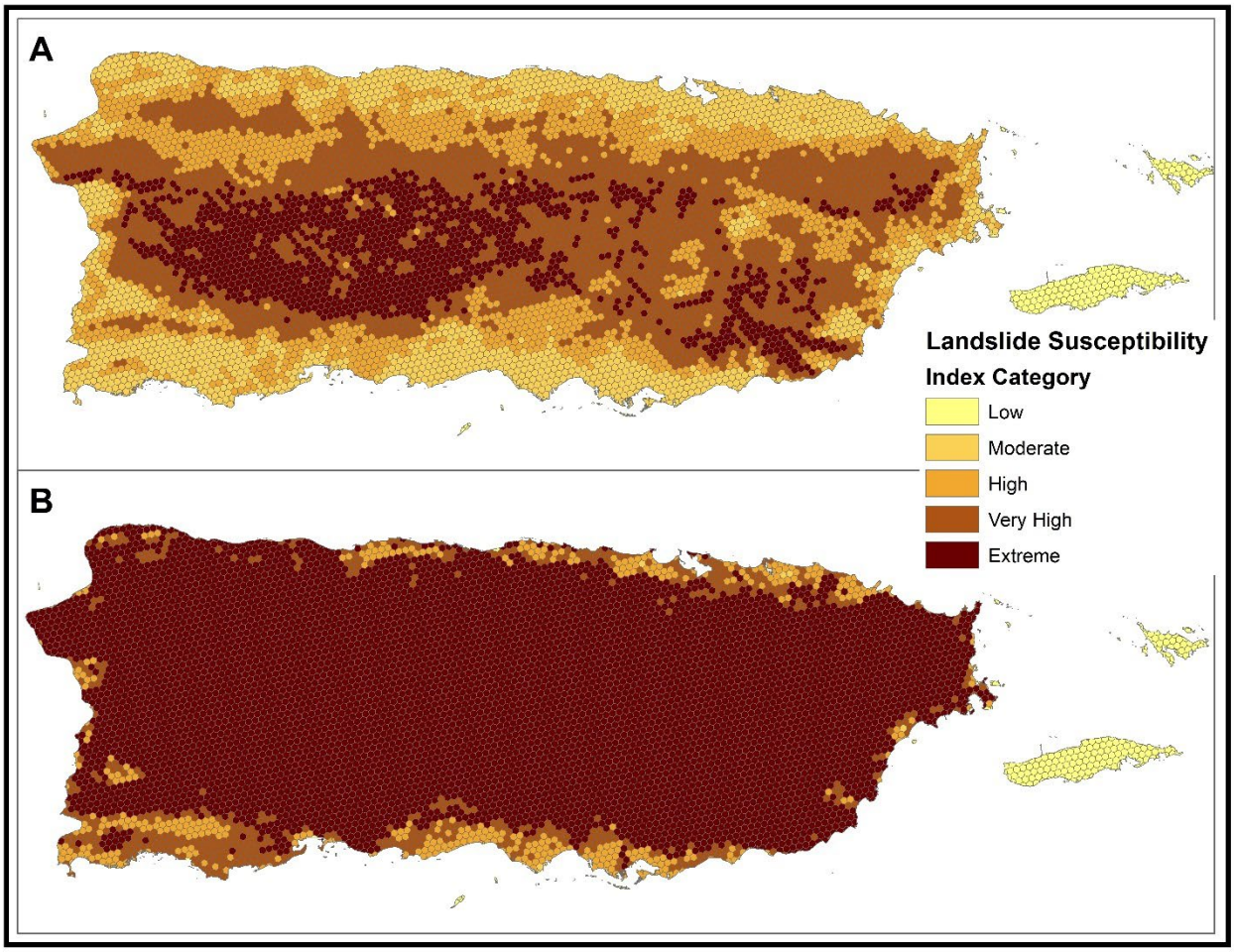


Figure 25: Rain Induced Landslide Susceptibility Index Average (A) vs Maximum (B) Score Comparison

Hazard Frequency Analysis Results

Figure 26 and **Figure 27**, illustrates the results of this analysis for the impacted areas.

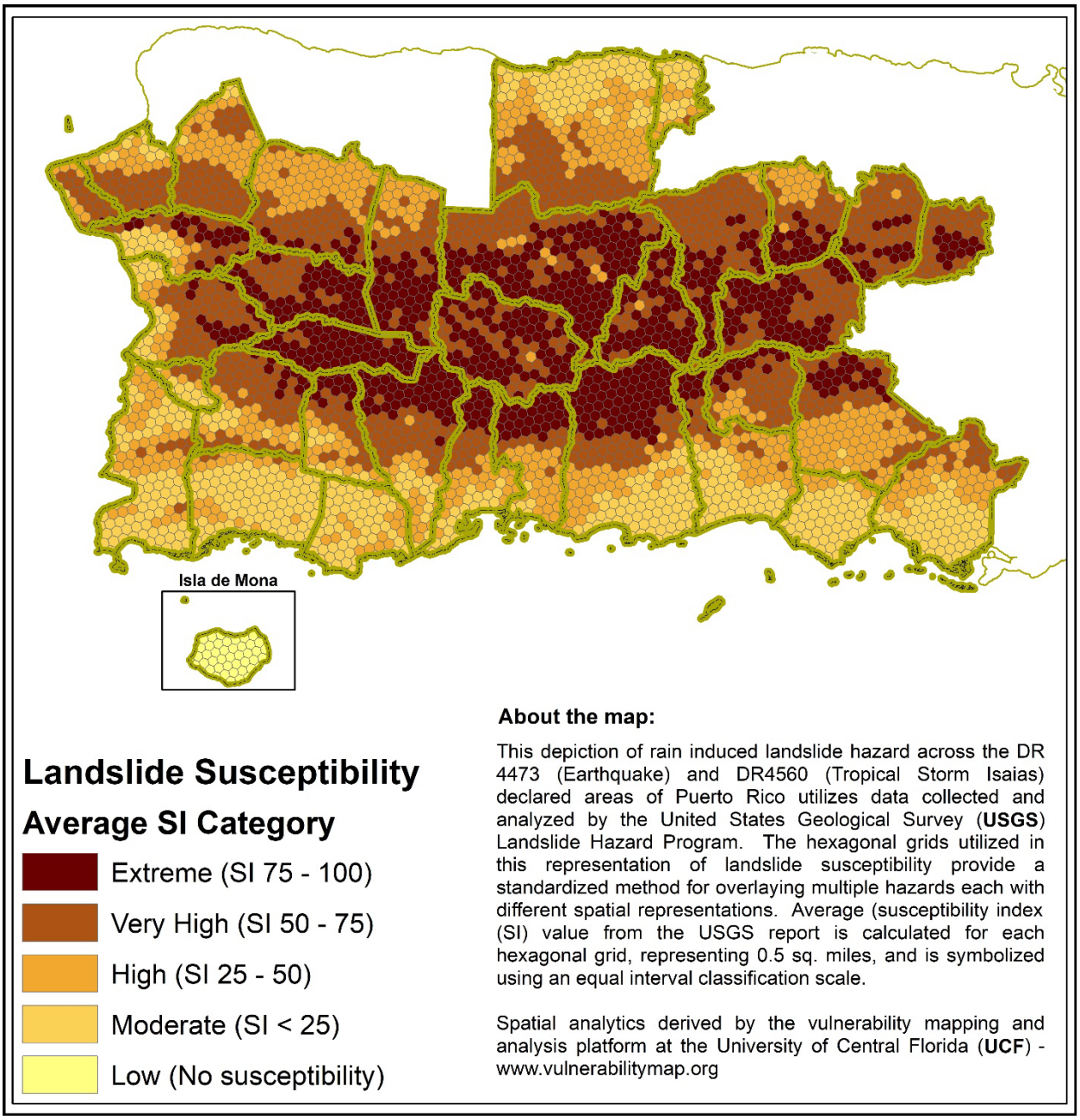


Figure 26: Landslide Susceptibility

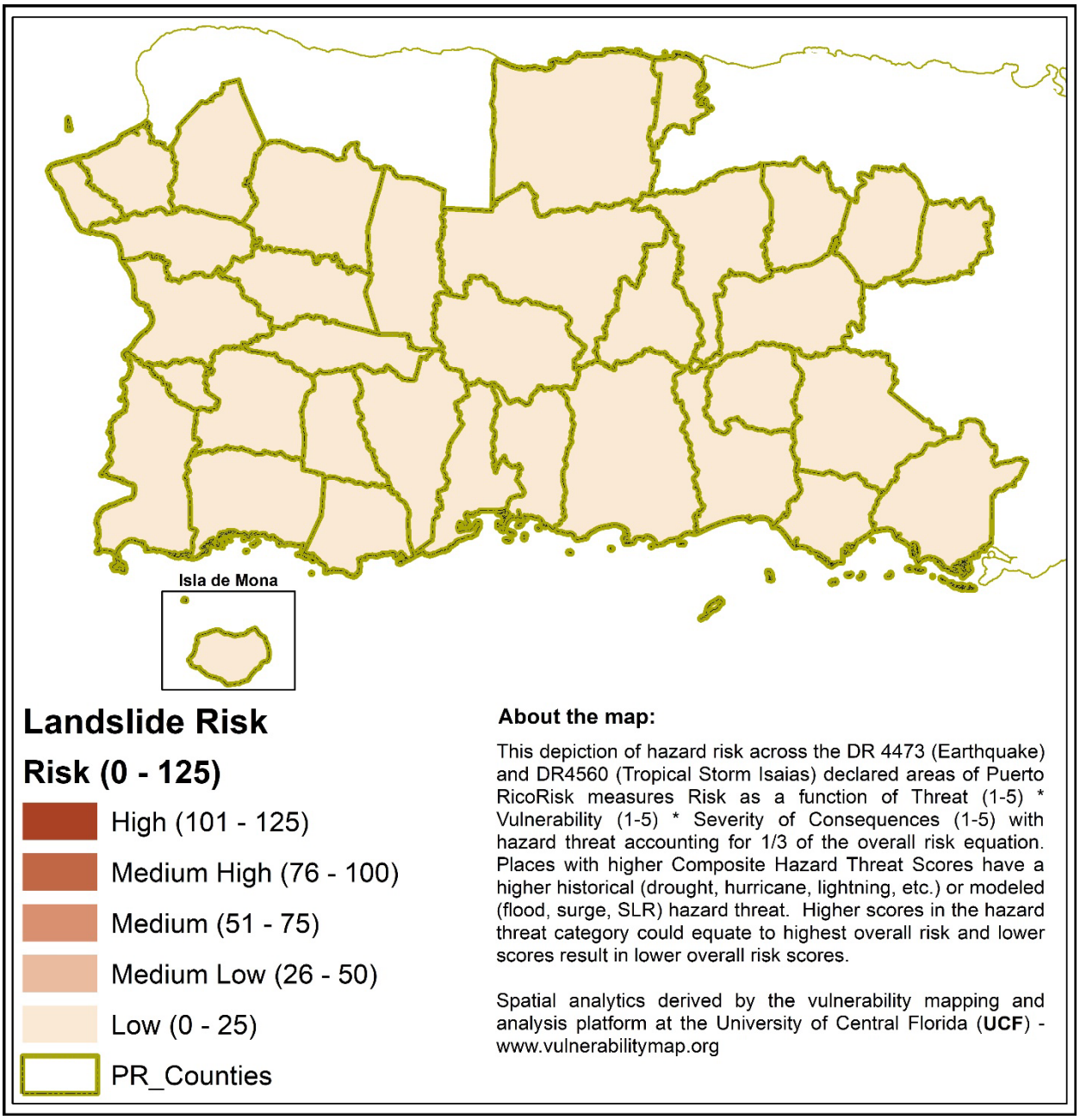


Figure 27. Landslide Risk in impacted area

Earthquakes

Hazard Overview

As with most of the Caribbean, Puerto Rico is subject to significant threat from earthquakes. Earthquakes represent a particularly severe threat due to irregular time intervals between these events, lack of adequate forecasts, and the catastrophic damage that can occur as a result of a significant event of this nature.

An earthquake is caused by the release of stored energy within, or along the edge of, the tectonic plates of the Earth. They are characterized by a sudden shaking of the earth. The severity of an earthquake depends on its place of origin (epicenter) and the amount of energy released. Upon the occurrence of the earthquake, seismic waves radiate from the earthquake source, causing the shaking of the earth. The severity of the tremor increases as energy is released and decreases according to its distance from the epicenter. The tremors can be felt hundreds of miles from its epicenter. The intensity of shaking is the result of several factors, such as: the extent and type of earthquake, the distance from the epicenter, the area's soil conditions, and the relative orientation of the site with respect to the seismic event.

Among the damage earthquakes can cause are liquefaction, landslides, and significant damage to buildings and infrastructure. Liquefaction is a phenomenon that causes unconsolidated soils to lose their strength and act similar to a viscous fluid (like quicksand) when these soils are subject to tremors due to an earthquake. The frequency and intensity of liquefaction that can occur during an earthquake is impacted by several factors including: the geological conditions of the area, groundwater depth, the tremor severity, and magnitude of the earthquake.

Earthquakes can cause landslides and other types of soil failures. Landslides are sudden movements of materials that emerge from the hills or mountains, free fall, sliding or rolling down. Landslides caused by earthquakes can occur on natural slopes, cut slopes on the ground, eroded rocks, or filled slopes. They are common in areas where they are abruptly cut off the slopes, on plain soils or fractured eroded rock. The frequency and intensity of landslides that may occur during an earthquake are due to several factors, including: geological materials contained in the area, the steepness of the slope, the water content of the material that slides, trembling land, and the magnitude of the earthquake.

Data and Methods

The USGS, charged with overseeing all geophysical hazard activity in the U.S. and its protectorates, has completed several studies of earthquake risk for Puerto Rico. One of the most recent is a 2003 study of U.S. Seismic Hazard Maps – Puerto Rico and the U.S. Virgin Islands, Samoa and the Pacific Islands, and Guam and the Northern Mariana Islands.[45] This study provides gridded seismic hazard curve data, gridded ground motion data, and mapped gridded ground motion values for the Puerto Rico region. In this case, as in many probabilistic seismic hazard analysis (**PHSA**), the greater than two percent (2%) probability of peak ground acceleration (**PGA**) has become the de facto measure for

[45] United States. USGS. *U.S. Seismic Hazard Maps – Puerto Rico and the U.S. Virgin Islands, Samoa and the Pacific Islands, and Guam and Northern Mariana Islands*. Accessed at: https://www.usgs.gov/natural-hazards/earthquake-hazards/science/us-seismic-hazard-maps-puerto-rico-and-us-virgin-islands?qt-science_center_objects=0#qt-science_center_objects

estimating seismic activity. Although considerable discussion in seismology, engineering, and emergency management is beginning to shift away from PHSA and PGA as a measure of risk[46,47] (e.g., hazard X vulnerability) it still proves to be useful for understanding the occurrence frequency of ground shaking. For the purposes of this hazard assessment, the greater than two percent (>2%) exceedance of Peak Ground Acceleration provides a useful tool for understanding where the hazard is likely to occur, but not which buildings or communities are likely to be adversely impacted. In this assessment, average PGA values were calculated for each hexagonal grid and mapped using standard deviations showing us a clear pattern of increased hazard across Puerto Rico.

Hazard Frequency Analysis Results

Figure 28 and **Figure 29** illustrates the assessment for this in the impacted area.

[46] Wang, Z. *Understanding Seismic Hazard and Risk A Gap Between Engineers and Seismologists*. Accessed at: https://www.researchgate.net/publication/260318371_Understanding_seismic_hazard_and_risk_A_gap_between_engineers_and_seismologists

[47] Mulargia, Francesco, Stark, Philip B., Geller, Robert J. *Why is Probabilistic Seismic Hazard Analysis (PHSA) still used?* Physics of the Earth and Planetary Interiors, Volume 264, March 2017, Pages 63-75. Accessed at: https://www.sciencedirect.com/science/article/pii/S0031920116303016

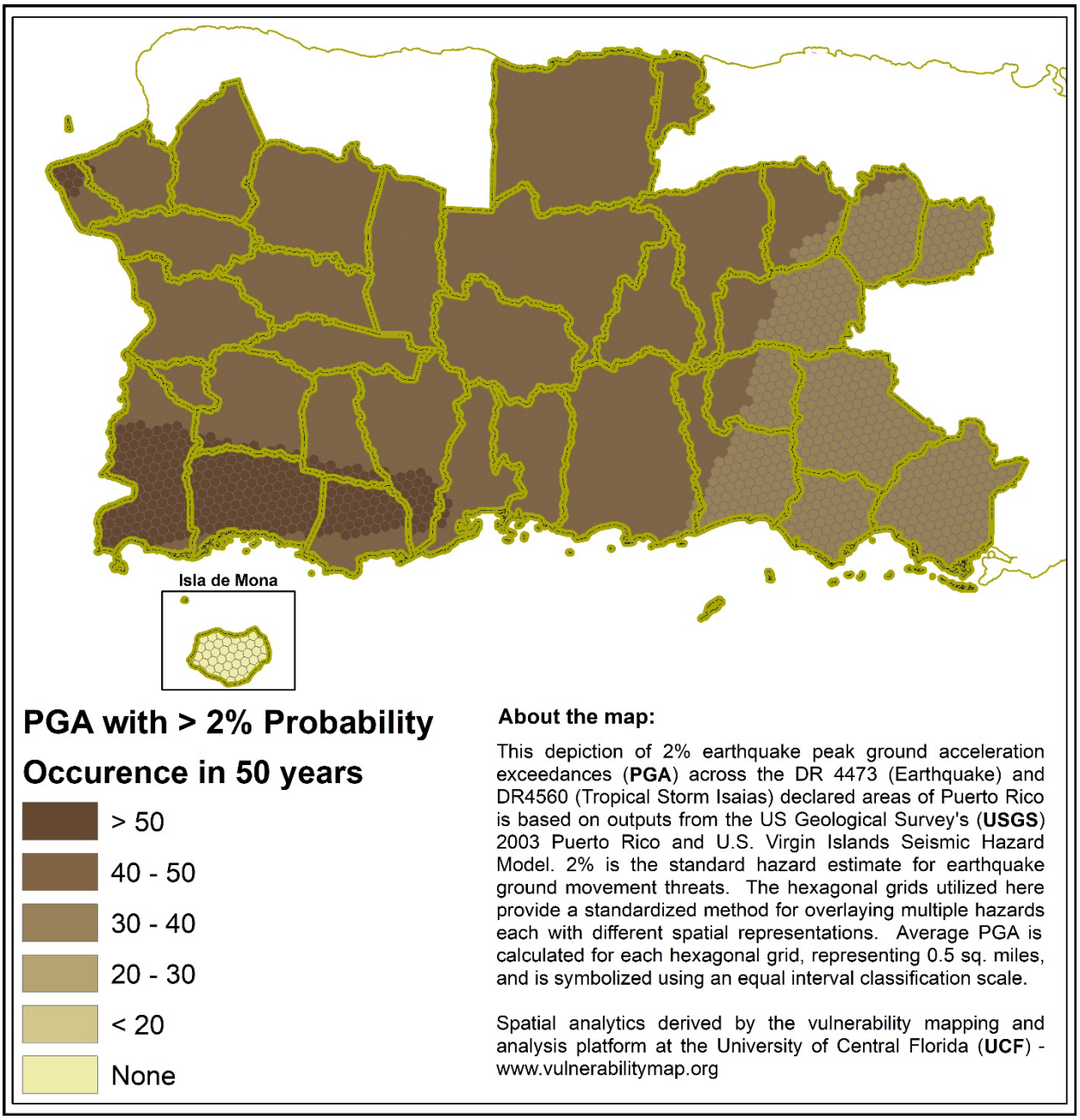


Figure 16: PGA with >2% Probability Occurrence in 50 years

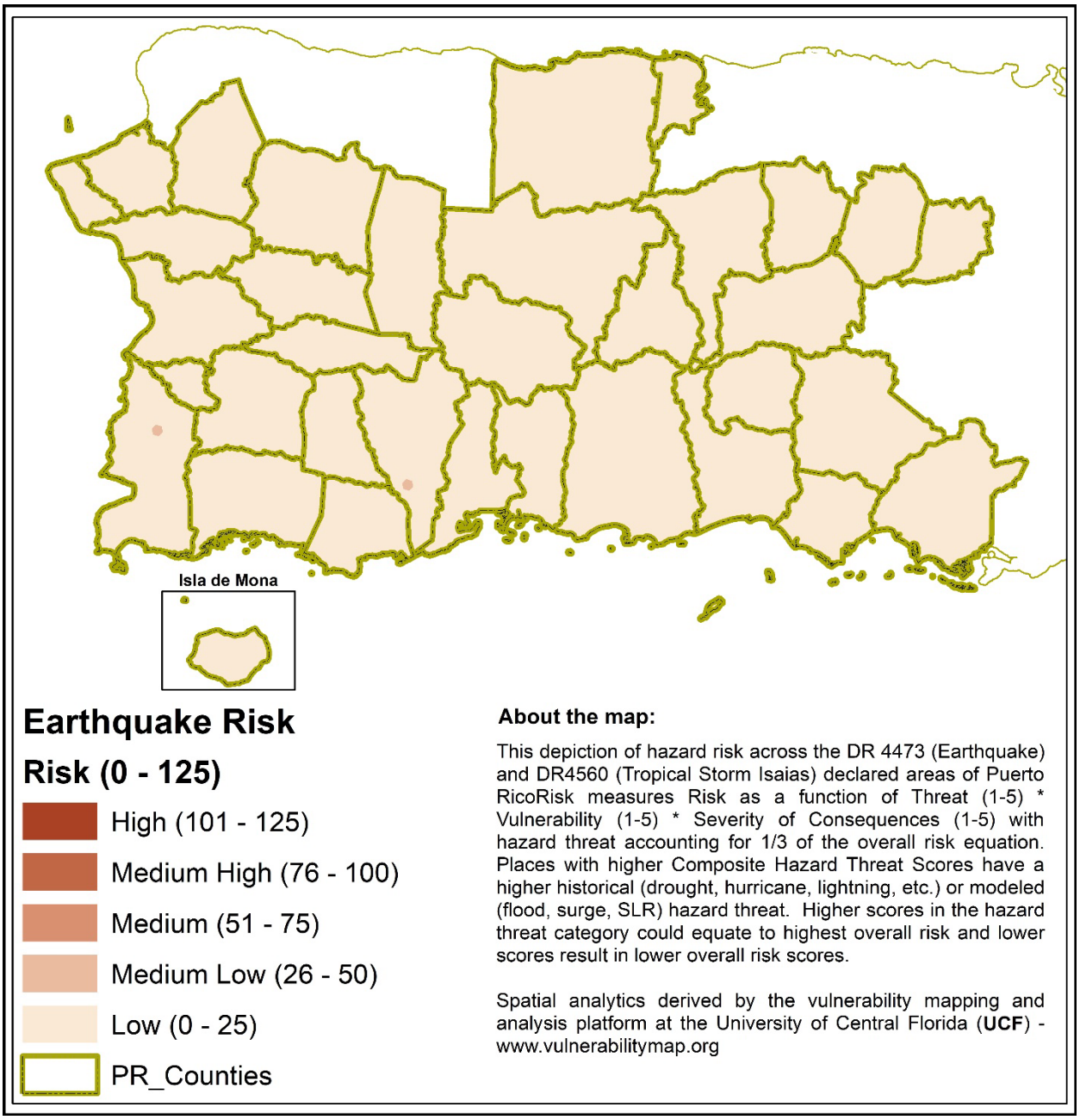


Figure 29: Earthquake Risk

ASSESSMENT OF SEVERITY OF CONSEQUENCE

Each single hazard event and event type (earthquake, hurricane, etc.) has a different severity of consequence. Creating a universal understanding of hazard risk for Puerto Rico required a robust accounting of consequences from historical losses as well as the ability to project future scenarios. To assess the risk, this report had to address possible climate sensitivities, current high priority hazards, and those likely to cause continued losses if not mitigated. Consequently, this assessment calculates Severity of

Consequences (see **Equation 1**) using equal parts Historical Consequence, Climate Sensitivity, a measure of probability versus consequence, and a measure of future impacts (or high priority hazards for Puerto Rico) derived from the Government of Puerto Rico's current Hazard Mitigation Plan.[48]

Equation 1: Severity of Consequences Calculation

$$CON_{HAZ_n} = (HISTORIC\ CONSEQUENCE) + (CLIMATE\ SENSITIVE) + (PROBABILITY\ CONSEQUENCE) + (FUTURE\ CONSEQUENCE)$$

HAZ= Flood, Earthquake, Landslide, Category-1 Storm Surge, Category-2 Storm Surge, Category-3 Storm Surge, Category-4 Storm Surge, Category-5 Storm Surge, Severe Storm, Tsunami, Drought, Wind, Fog, Hail, High Temperature, Lightning, Tornado, Wildfire, Sea Level Rise 1-foot, Sea Level Rise 4-foot, Sea Level Rise 10-foot, Liquefaction, Human Hazard, Hurricane Force Wind;

Table 2522: Severity of Consequence Analysis

Hazard	Historical Frequency Score (0-1)	Historical Economic Impact (0-1)	Historical Fatality Score (0-1)	Historical Injury Score (0-1)	Sum of Historical Scores (0-4)	Climate Sensitive (0-1)	Probability / Consequence (0-1)	Future Consequence (0-	Composite SOC Score (0-7)	Standardized SOC Score (0-1)	Rank	Severity of Consequences Score
Flood	0.25	1.00	1.00	0.05	2.30	1.00	0.50	1.00	4.80	1.00	1.00	5.00
Coastal Flood and SLR	0.01	0.00	0.31	0.20	0.52	1.00	0.50	1.00	3.02	0.51	2.00	2.53
Hurricane (Surge and Wind)	0.01	0.17	0.06	0.01	0.26	1.00	0.75	1.00	3.01	0.50	3.00	2.51
Earthquake and Liquefaction	0.00	0.15	0.00	0.00	0.15	0.00	1.00	1.00	2.15	0.26	4.00	1.31
Landslide	0.04	0.00	0.04	0.05	0.13	1.00	0.50	0.50	2.13	0.26	5.00	1.28
Drought	0.00	0.00	0.00	0.00	0.00	1.00	0.50	0.50	2.00	0.22	6.00	1.11
Tsunami	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	2.00	0.22	7.00	1.10
Human Hazards	0.05	0.00	0.31	0.50	0.86	0.00	0.50	0.50	1.86	0.18	8.00	0.91
Wildfire	0.00	0.00	0.00	0.00	0.01	1.00	0.25	0.50	1.76	0.15	9.00	0.76

[48] *2016 Puerto Rico Hazard Mitigation Plan*. Accessed under file name "Puerto Rico Plan de Mitigación-Aprobado 02/08/2016" at the following website location: https://recovery.pr/en/document-library

Severe Storm	0.10	0.00	0.19	0.26	0.55	1.00	0.10	0.10	1.75	0.15	10.00	0.75
Fog	0.50	0.00	0.03	0.00	0.53	1.00	0.10	0.10	1.73	0.15	11.00	0.72
Lightning	0.00	0.00	0.09	0.07	0.16	1.00	0.25	0.10	1.51	0.08	12.00	0.42
Tornado	0.01	0.00	0.00	0.00	0.01	1.00	0.25	0.10	1.37	0.04	13.00	0.22
Wind	0.00	0.00	0.00	0.02	0.03	1.00	0.10	0.10	1.23	0.01	14.00	0.03
Hail	0.01	0.00	0.00	0.01	0.02	1.00	0.10	0.10	1.22	0.00	15.00	0.01
Heat	0.01	0.00	0.00	0.00	0.01	1.00	0.10	0.10	1.21	0.00	16.00	0.00

RISK ASSESSMENT RESULTS IN THE DISASTER IMPACTED AREAS

Mitigation is determined according to the comprehensive hazard assessment for all eighteen (18) assessed hazards, profiled extensively in the CDBG-MIT Action Plan and associated web-based tools. For the purposes of this Action Plan, the hazards included in this narrative are focused on those with high risks within the area of impact, as related to the assessment of earthquake and hurricane.

Aggregate risk is determined by the sum of risk for each hazard per 0.5-square-mile hex grid (see **Equation 2**). The map on the following page shows the aggregate risk in Puerto Rico at the hex grid level.

Equation 2: Total Risk Calculation

$$SUM\ RISK\ = \sum_{n=1}^{24} RISK_{HAZ_n}$$

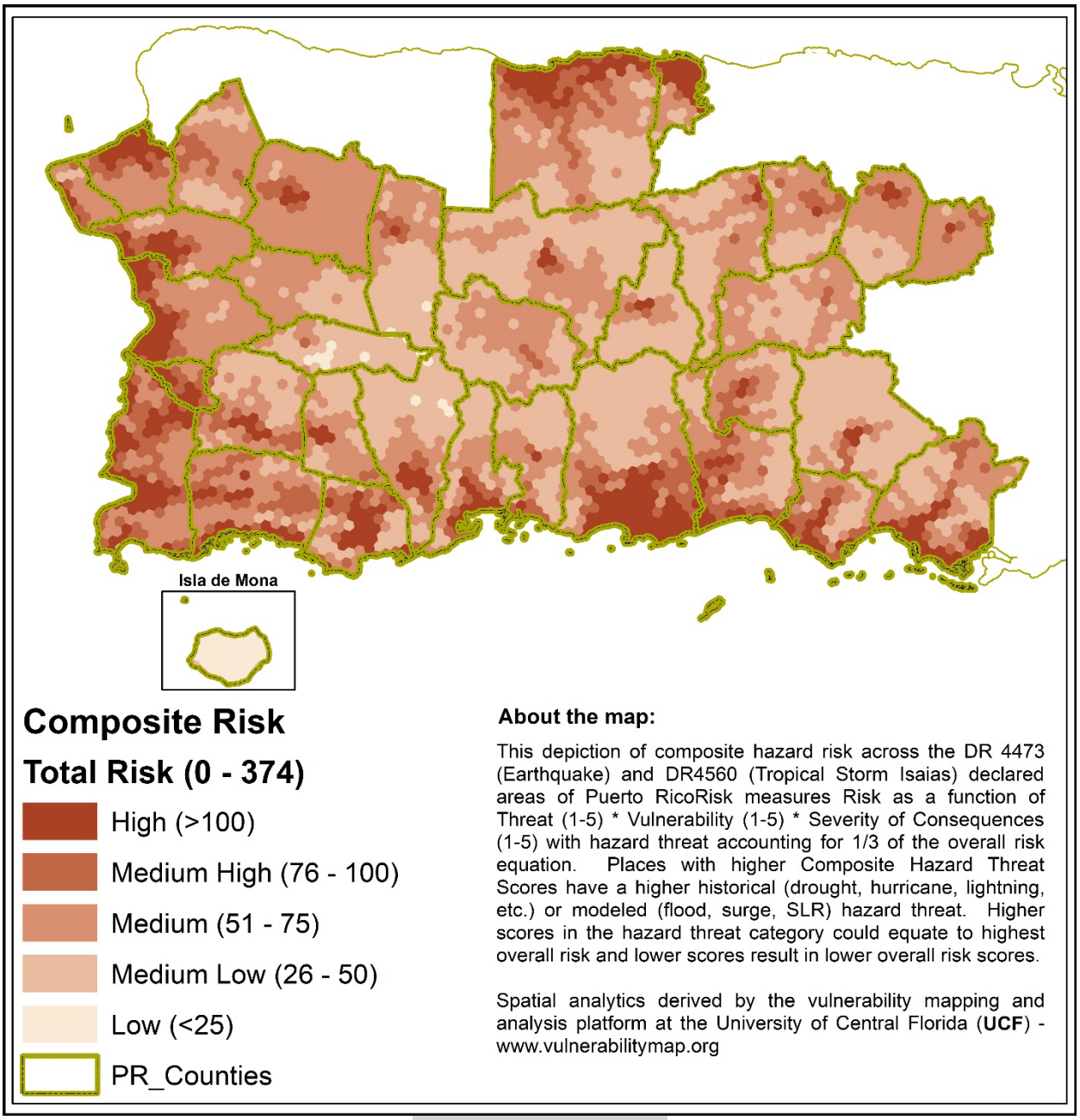


Figure 30: Composite Risk

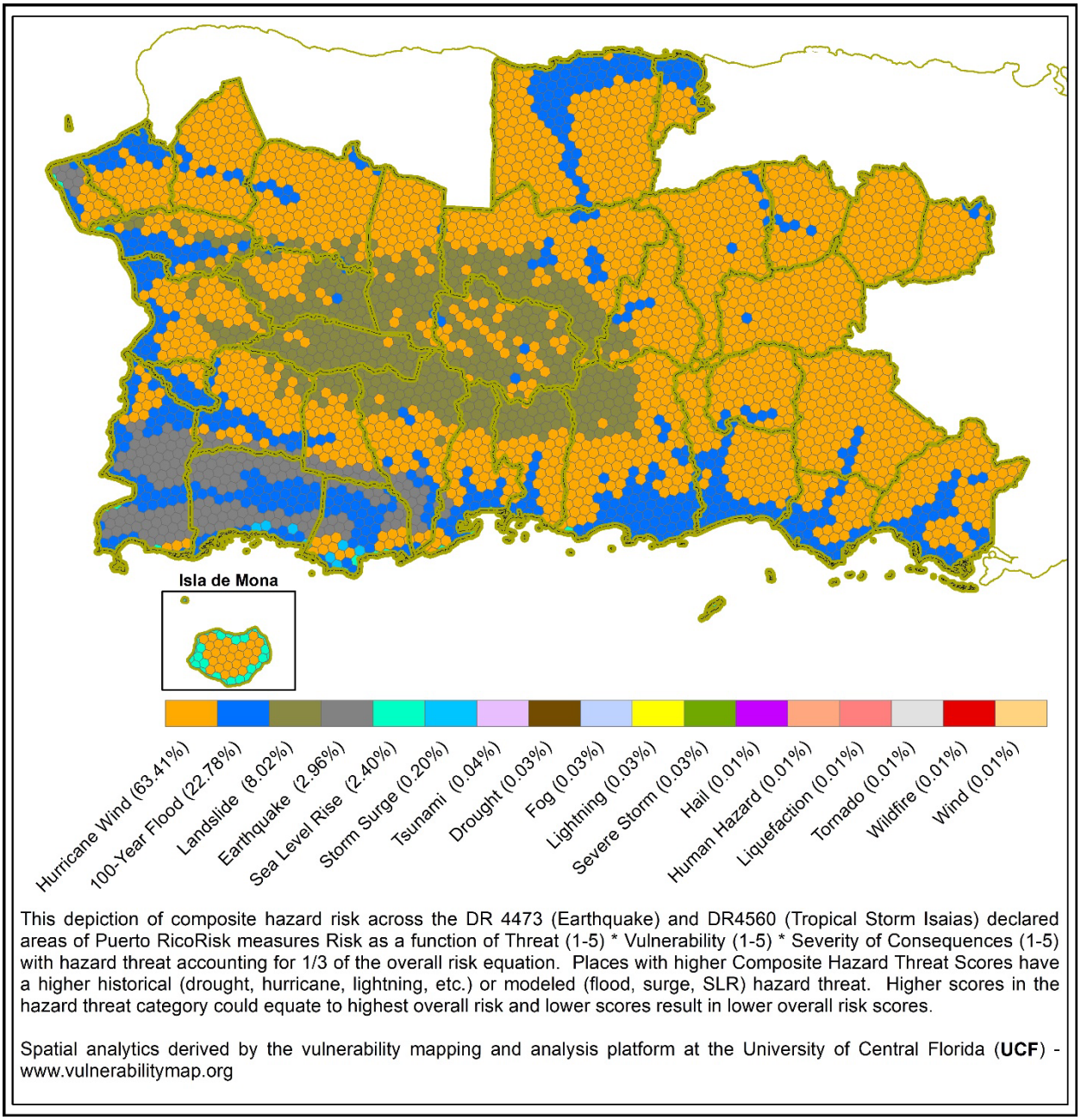


Figure 31: Risk percentages by categories

SUMMARY OF TOP RISKS IN THE DISASTER IMPACTED AREAS

The top five (5) risks for municipalities within the area of impact are shown in Table 26. Risk Assessment Results by Municipality.

Table 26: Risk Assessment Results by Municipality

Top 5 Hazard Risk by Municipality					
Municipality	Top Risk	2nd Highest Risk	3rd Highest Risk	4th Highest Risk	5th Highest Risk
Adjuntas	Hurricane Wind	Landslide	Earthquake	100-Year Flooding	Lightning
Aguada	Hurricane Wind	100-Year Flooding	Earthquake	Landslide	Liquefaction
Añasco	100-Year Flooding	Hurricane Wind	Earthquake	Landslide	Severe Storm
Arecibo	Hurricane Wind	Earthquake	100-Year Flooding	Landslide	Liquefaction
Arroyo	Hurricane Wind	100-Year Flooding	Landslide	Earthquake	Drought
Barceloneta	100-Year Flooding	Hurricane Wind	Earthquake	SLR (10 Feet)	Liquefaction
Cabo Rojo	100-Year Flooding	Hurricane Wind	Earthquake	Liquefaction	SLR (10 Feet)
Ciales	Hurricane Wind	Landslide	Earthquake	Severe Storm	100-Year Flooding
Coamo	Hurricane Wind	Landslide	Earthquake	Drought	100-Year Flooding
Corozal	Hurricane Wind	Landslide	Earthquake	Drought	Severe Storm
Guánica	100-Year Flooding	Hurricane Wind	Earthquake	SLR (10 Feet)	Landslide
Guayanilla	Hurricane Wind	100-Year Flooding	Earthquake	Landslide	Drought
Hormigueros	100-Year Flooding	Hurricane Wind	Earthquake	Liquefaction	Landslide
Jayuya	Hurricane Wind	Landslide	Earthquake	Severe Storm	Liquefaction
Juana Díaz	Hurricane Wind	100-Year Flooding	Earthquake	Landslide	Drought
Lajas	100-Year Flooding	Earthquake	Hurricane Wind	Landslide	Liquefaction
Lares	Hurricane Wind	Earthquake	Landslide	Lightning	Severe Storm
Las Marías	Hurricane Wind	Landslide	Earthquake	Severe Storm	Lightning

Top 5 Hazard Risk by Municipality					
Municipality	Top Risk	2nd Highest Risk	3rd Highest Risk	4th Highest Risk	5th Highest Risk
Maricao	Landslide	Hurricane Wind	Earthquake	Severe Storm	Lightning
Mayagüez	100-Year Flooding	Hurricane Wind	Earthquake	Landslide	SLR (10 Feet)
Moca	Hurricane Wind	Earthquake	Landslide	Severe Storm	Liquefaction
Morovis	Hurricane Wind	Landslide	Earthquake	Severe Storm	Liquefaction
Naranjito	Hurricane Wind	Landslide	Earthquake	Drought	100-Year Flooding
Orocovis	Hurricane Wind	Landslide	Earthquake	Drought	Severe Storm
Peñuelas	Hurricane Wind	Earthquake	100-Year Flooding	Landslide	Drought
Ponce	100-Year Flooding	Hurricane Wind	Earthquake	Landslide	Drought
Rincón	Hurricane Wind	Earthquake	Landslide	100-Year Flooding	SLR (10 Feet)
Sabana Grande	Hurricane Wind	Earthquake	Landslide	Wildfire	Liquefaction
Salinas	Hurricane Wind	100-Year Flooding	Drought	Earthquake	Landslide
San Germán	Hurricane Wind	Earthquake	100-Year Flooding	Landslide	Liquefaction
San Sebastián	Hurricane Wind	Earthquake	Landslide	Severe Storm	100-Year Flooding
Santa Isabel	100-Year Flooding	Hurricane Wind	Earthquake	Drought	SLR (10 Feet)
Utuado	Hurricane Wind	Landslide	Earthquake	100-Year Flooding	Lightning
Villalba	Hurricane Wind	Landslide	Earthquake	100-Year Flooding	Severe Storm
Yauco	Hurricane Wind	Earthquake	Landslide	100-Year Flooding	Drought

Nine (9) of the eighteen (18) assessed hazards appear in the top 5 risk results for municipalities within the area of impact. These include the following: earthquake,

hurricane wind, landslide, 100-year flooding, severe storm, liquefaction, sea level rise, lightning, and drought.

METHOD OF DISTRIBUTION

METHOD OF DISTRIBUTION

PRDOH may utilize two (2) distribution models for its earthquake disaster recovery program as shown in models A and B in the graphic below. These Methods of Distribution (**MODs**) shall be utilized to implement the program as outlined in detail within the program description in the following pages.

Municipalities and stakeholders will play an active role in the program. Although regional collaboration is highly encouraged, for the purposes of duties and operations conducted under these programs, Subrecipients shall perform work only in their programmatic areas. Programs will be administered by PRDOH under one of these models:

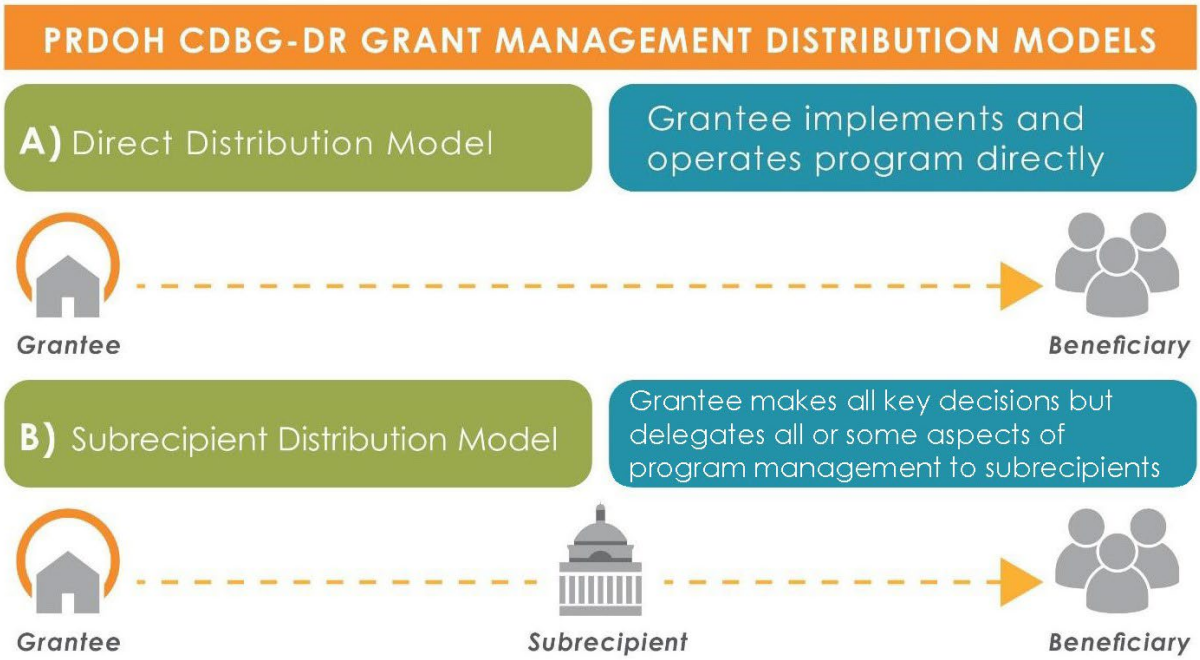


Figure 32 ~~17~~: Method of Distribution models for PRDOH CDBG-DR Programs

Grantee
The Government of Puerto Rico is formally the Grantee for the CDBG-DR funds. The Governor has designated PRDOH as the grantee for purposes of administering the program and executing grant agreements with HUD. Therefore, PRDOH will be referred to as the grantee in this Action Plan and in administrative agreements with HUD.

Beneficiary
Beneficiaries are the persons to whom assistance, services or benefits are ultimately provided. Eligible beneficiaries are defined for each program in the Action Plan.

Subrecipients
Subrecipients are chosen by the grantee to undertake certain eligible CDBG activities. Subrecipient means a public or private nonprofit agency, authority, or organization, or a

for-profit entity authorized under 24 C.F.R. §570.201(o), receiving CDBG funds from the recipient or another subrecipient to undertake activities eligible for such assistance. Subrecipients may include public and private organizations, agencies, including nonprofit and for-profit subrecipients, as applicable for the program established in the Action Plan. For-profits may only be included as subrecipients when assisting with economic development and micro-enterprise activities, unless otherwise waived by HUD. Subrecipients will meet the selection criteria outlined in the Action Plan and/or program guidelines and will:

- Carry out specified program on behalf of PRDOH
- Comply with all Federal statutes, regulations, and program requirements
- Comply with all terms and conditions of the subrecipient agreement
- Meet all established performance goals

PRDOH is the responsible entity for subrecipient compliance and performance and Environmental Review under 24 C.F.R. ~~§~~ Part 58. Agreements with subrecipients will comply with 24 C.F.R. § 570.503. Therefore, Subrecipients who fail to meet any of the criteria outlined above, or as specified in their Subrecipient Agreement (**SRA**), may have their ability to carry out program activities rescinded, in which case, activities would be managed by PRDOH or its Subrecipient, or funds redistributed in accordance with the Action Plan.

PROGRAM REQUIREMENTS

PROGRAM REQUIREMENTS

CDBG-DR PROGRAM REQUIREMENTS

National Objective

All programs supported by HUD CDBG-DR assistance must demonstrate benefit to individuals and communities by meeting one (1) of the program's three (**3**) National Objectives for all money spent on projects. These are: (1) benefiting low-and moderate income (**LMI**) persons, (2) aiding in the prevention or elimination of slums or blight, or (3) meeting a need having particular urgency (urgent need).

Low- to moderate- income households are defined as households that do not exceed 80% of the median income for their area, as ~~determined~~ updated by HUD annually. These income categories are grouped into the following classifications:

- Extremely Low income – has an annual income at 30% or below the area median income
- Very Low income – has an annual income at 31% to 50% of the area median income; and
- Low income – has an annual income at 51% to 80% of the area median income.

The income limit tables for Puerto Rico[49] are included as Appendix D~~E~~ to this plan.

In compliance with the HCDA, and as announced in 87 FR 6364 ~~83 FR 5844~~, the primary objective of the HCDA is the "development of viable urban communities, by providing decent housing and a suitable living environment and expanding economic opportunities, principally for persons of low and moderate income" (42 U.S.C. § 5301(c)). To carry out this objective, the statute requires that not less than 70% of the aggregate of CDBG program funds be used to support activities benefitting LMI persons. The 70% overall benefit requirement shall remain in effect for this allocation, unless waived pursuant to a request by an individual grantee to authorize a lower overall benefit for its CDBG-DR grant based on a determination by HUD of compelling need for the reduction.

Duplication of Benefit (DOB)

In accordance with the Robert T. Stafford Disaster Relief and Emergency Assistance Act (42 U.S.C. §§5121–5207), as amended, and CDBG-DR appropriations acts, Puerto Rico will implement policies and procedures to ensure no individual receives duplication of benefit for the same purpose and/or effect to recover from the earthquakes or Tropical Storm Isaías. Federal law prohibits any person, business concern, or other entity from receiving Federal funds for any part of such loss as to which they have received financial assistance under any other program, from private insurance, charitable assistance, or any other source. Detailed policies and procedures for assessing DOB will be included in program guidelines. The ~~duplication of benefits~~ DOB guidance included in Federal Register Vol. 84, No. 119 (June 20, 2019), 84 FR 28836, ~~supersedes~~ updates the duplication

[49] Retrieved from: *https://www.hudexchange.info/resource/5334/cdbg-income-limits/*

of benefits guidance issued in Federal Register Vol. 76, No. 221 (November 16, 2011), 76 FR 71060, for CDBG-DR grants received in response to disasters declared between January 1, 2015, and December 31, 2021. As such, the DOB policy to be outlined in the program guidelines will follow the guidance issued in 84 FR 28836.

Pre-agreement Costs

The provisions of 24 C.F.R. § 570.489(b) and 570.200 (h) permits a grantee to reimburse itself for otherwise allowable costs incurred by itself or its recipients sub grantees or sub recipients on or after the incident of the covered disaster. The provisions at 24 C.F.R. § 570.200(h) and 570.489(b) apply to grantees reimbursing costs incurred by itself or its recipients or subrecipients prior to the execution of a grant agreement with HUD. This includes but is not limited to activities supporting program development, action plan development and stakeholder involvement support, and other qualifying eligible costs incurred in response to an eligible disaster covered under Public Law 116-20 and Public Law 117-43.

PRDOH incurred in pre-agreement costs and may seek reimbursement for these costs that are reasonable and allowable under this regulation. PRDOH may recover the pre-agreement costs consistent with the authority cited in this section. These costs include the cost for salary, employer fringe benefits, and direct operating cost for each employee based on their individual percentage of time spent on the planning of the CDBG-DR program during a pay period. Any cost associated with the disaster recovery efforts will be allocated based on the total time spent on CDBG-DR activities versus other duties for a particular month.

The total cost of PRDOH or its awarded contractors or ~~subrecipientes~~ subrecipients to assist with disaster recovery research and analysis to help PRDOH prepare the unmet needs assessment and action plan and other costs associated with meetings, community outreach, and any other direct costs associated with the Action Plan may be reimbursed by this CDBG-DR grant. Additionally, once contracted, PRDOH may allow the drawdown of pre-agreement costs associated with eligible disaster recovery activities dating back to the date of the disaster(s) for subrecipients and PRDOH with appropriate documentation.

Program Income

Puerto Rico does not anticipate it will generate program income as part of the activities allowed under ~~this~~ these allocations. Should any funds be generated, recovery of funds including program income, refunds, and rebates will be used before drawing down additional CDBG-DR funds, as per 87 FR 6364, 6385 ~~83 FR 5844, 5853~~. These amounts will be recorded and tracked in the accounting systems and recorded in the HUD Disaster Recovery Grant Reporting (**DRGR**) system. The DRGR system requires grantees to use program income before drawing additional grant funds and ensures that program income retained will not affect grant draw requests for other subrecipients. Subrecipients will be required to report program income at least quarterly and will be subject to

applicable regulations from PRDOH and HUD directives. Retention of program income will be in compliance with any subrecipient agreements.

Minimizing or Addressing Displacement

PRDOH plans to minimize displacement of persons or entities and assist persons or entities displaced as a result of implementing a project with CDBG-DR funds. This is not intended to limit the ability of PRDOH to conduct buyouts or acquisitions for destroyed and extensively damaged units or units. PRDOH will ensure that every project funded in part or in full by CDBG-DR funds, and all activities related to that project, are subject to the provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (**URA**), as amended,[50] and section 104(d) of the Housing and Community Development Act of 1974 (**HCDA**),[51] except where waivers or alternative requirements have been provided by HUD. The implementing regulations for URA are at 49 C.F.R. ~~§~~ Part 24, and the regulations for section 104(d) are at 24 C.F.R. ~~§~~ Part 42, subpart C. The primary purpose of these laws and regulations is to provide uniform, fair, and equitable treatment of persons whose real property is acquired or who are displaced in connection with federally funded projects.

~~The Residential Anti-displacement and Relocation Assistance Plan (**RARAP**) will conform to the standards or requirements of 24 C.F.R. § 42.325(a) and (b). Based on the program outlined in the Action Plan, PRDOH plans to minimize displacement by arranging for facilities to house persons who must be relocated temporarily during rehabilitation. Additionally, HUD Approved Housing Counselors may provide homeowners and tenants with information on assistance available to help them remain in their neighborhood in the face of revitalization pressures.~~

Additional modifications to increase accessibility for applicants or household members of applicants who have access and functional needs is an allowable part of the repair, or reconstruction assistance provided by the Program. Eligible applicants who require additional accessibility accommodations will be provided with accessibility options during the pre-construction meeting (for repair or reconstruction) or during the pre-award meeting (for relocation). Additional reasonable permanent accessibility options will be available to applicants if the applicant or a member of the household requires such accommodations. The costs associated with the accommodations may be considered in addition to the Program caps and evaluated for cost reasonableness. The Uniform Relocation Assistance Guide & Residential Anti-Displacement and Relocation Assistance Plan ~~Act and Anti-Displacement Policy~~[52] as well as all General Policies are available in English and Spanish at https://www.cdbg-dr.pr.gov/en/resources/policies/general-policies/ and https://www.cdbg-dr.pr.gov/recursos/politicas/politicas-generales/.

[50] 49 C.F.R. ~~§~~ Part 24
[51] 42 U.S.C. § 5301 *et seq*.
[52] The URA and ADP ~~Policy~~ Guide has been developed for CDBG-DR programs and will carry through into implementation of the CDBG-MIT Program.

In addition, HUD requires PRDOH to define "demonstrable hardship" and how it applies to applicants. PRDOH will consider "demonstrable hardship" as exceptions to program policies, including post-assistance affordability requirements for the single-family program, for applicants who demonstrate undue hardship. Applicants in this situation will be reviewed on a case-by-case basis to determine whether assistance is required to alleviate such hardship. Demonstrable hardship may include, but is not limited to, excessive amounts of debt due to a natural disaster, prolonged job loss, substantial reduction to household income, death of a family member, unexpected and extraordinary medical bills, disability, mental health impacts as a result of the 2019-2020 Southwest Puerto Rico earthquake sequence and Tropical Storm Isaías, among others.

Ineligible Activities

As per the Federal Register Notice 87 FR 6364, 6388 ~~83 FR 5844, 5864, 5865~~ the following are ineligible activities for this CDBG-DR Program:

i. Properties that served as second homes at the time of the disaster, or following the disaster, are not eligible for rehabilitation assistance or housing incentives. A second home is defined under the Federal Register as a home that is not the primary residence of the owner, a tenant, or any occupant at the time of the disaster or at the time of application for assistance.
ii. Rehabilitation/reconstruction of homes located in the floodway;
iii. Forced mortgage payoff;
iv. Rehabilitation/reconstruction of a house in which:
    a. The combined household income is greater than 120% AMI or the national median; and
    b. The property was located in a floodplain at the time of the disaster; and
    c. The property owner did not maintain flood insurance on the damaged property, even when the property owner was not required to obtain and maintain such insurance.
v. Section 582 of the National Flood Insurance Reform Act of 1994, as amended, (42 U.S.C. § 5154a) states that no Federal disaster relief assistance made available in a flood disaster area may be used to make a payment (including any loan assistance payment) to a person for "repair, replacement, or restoration" for damage to any personal, residential, or commercial property if that person at any time has received Federal flood disaster assistance that was conditional on the person first having obtained flood insurance under applicable Federal law and the person has subsequently failed to obtain and maintain flood insurance as required under applicable Federal law on such property. The program may not provide disaster assistance for the repair, replacement, or restoration of a property to a person who has failed to meet

Given that the HUD Income Limits to establish LMI populations are extremely low in Puerto Rico, PRDOH sought a waiver from HUD regarding assistance prohibitions for households

with incomes greater than 120% AMI or at a 120% rate adjusted in accordance with Federal Poverty Levels. HUD has approved adjusted income limits, which are posted on the HUD and PRDOH websites. The eligibility criteria for this program will utilize the HUD-approved income limits.

Subrogation Agreement

Program beneficiaries must agree to a limited subrogation of any future awards related to 2019-2020 earthquakes sequence or Tropical Storm Isaías as applicable, to ensure compliance with Robert T. Stafford Act duplication of benefits. Funding award is contingent upon execution of this agreement. By this agreement, beneficiaries agree to repay any duplicative assistance if other disaster assistance for the same purpose later is received. For example, insurance proceeds received at a later date for the same damage that is being repaired by CDBG-DR would need to be repaid back to the program if it is determined to be duplicative.

Performance Schedule

Projections for expenditures and outcomes will be submitted to HUD with the Action Plan and will be amended as needed throughout the life of the grant.

Application Status

PRDOH and/or potential subrecipients or partners are required to maintain adequate means of informing applicants on the status of applications for disaster recovery assistance at all phases of program activities. PRDOH employs multiple methods of communications to ensure applicants receive timely and accurate information regarding their applications and will require potential subrecipients to provide applicants with timely and accurate information regarding application status for the Program/s managed by them. Methods of communications may include but are not limited to the PRDOH CDBG-DR website, email address, telephone, postal address, and letters. For applicant individuals, all communication protects the privacy of the applicant by strictly adhering to privacy procedures pertaining to publicly identifiable information (**PII**). PRDOH and/or its Subrecipient has established procedures for the protection of PII and require adherence to PII Procedures, as well as mandatory training for all relevant staff and assists all subrecipients and partners as necessary in the implementation of equivalent PII protocols. Safeguards to protect PII are overseen by managers and directors on an ongoing basis for their respective program area and any irregularities are reported to the compliance officer for resolution. PII Policy and all CDBG-DR General Policies are available in English and Spanish at: https://cdbg-dr.pr.gov/en/resources/policies/general-policies/ and https://cdbg-dr.pr.gov/recursos/politicas/politicas-generales/.

Municipalities who are subrecipients of the CDBG-DR Program are assigned two (2) consistent points of contact from PRDOH. Specific methods for application status

updates will be clarified in the Program Guidelines. Subrecipients will be required to provide timely and accurate information to participants about their application status.

Language assistance in the form of translation and/or interpretation services will be provided to applicants who lack sufficient ability to read, speak or understand the English or Spanish language. As needed, PRDOH or its Subrecipient will provide status updates and program materials in accessible formats in accordance with ADA requirements.

In addition to program specific protocol for application status updates as published in Program Guidelines, applicants may contact PRDOH at any time to request information at the contact information below:

- Via telephone: 1-833-234-CDBG or 1-833-234-2324 (TTY: 787-522-5950)
  Attention hours: Monday to Friday from 8:00am-5:00pm
- Via email at: infoCDBG@vivienda.pr.gov – for all CDBG-DR Earthquake Allocation Inquiries
- Online at: https://www.cdbg-dr.pr.gov/en/contact/ (English version)
  https://www.cdbg-dr.pr.gov/contact/ (Spanish version)
- In writing at: Puerto Rico CDBG-DR Program
  P.O. Box 21365
  San Juan, PR 00928-1365

Language

CDBG-DR Program implementation included completion of a Language Access Plan (**LAP**) for Puerto Rico.[53] Based on this analysis in the LAP, PRDOH is already taking measures to address these needs such as producing all programmatic documents in both English and Spanish. In accordance with HUD guidance, PRDOH should continue proactively providing "vital documents" in both English and Spanish and will require potential subrecipients to adhere to these policies.

Program-based Reconsideration and/or Administrative Review

Applicants may not challenge a federal statutory requirement. However, based on program policy, applicants may contest program determinations. Applicants will have the opportunity to submit a Reconsideration Request directly with a program or file an Administrative Review Request with PRDOH. The latter, in accordance with Regulation Number 4953, of August 19, 1993, regulates the Formal Adjudication Process for the PRDOH and its Adjunct Agencies (Regulation 4953).

PRDOH may delegate reconsideration process to the subrecipient. If an applicant disagrees with any final written response issued by PRDOH or its Subrecipient, said party

[53] The Language Access Plan can be accessed at: https://cdbg-dr.pr.gov/en/download/plan-de-acceso-al-idioma/ (English) and https://cdbg-dr.pr.gov/download/plan-de-acceso-al-idioma/ (Spanish).

may file a Judicial Review petition before the Court of Appeals of Puerto Rico within the timeframe established by law. See Act No. 201-2003, as amended, known as the Judiciary Act of the Commonwealth of Puerto Rico of 2003, 4 L.P.R.A. § 24 *et seq.*, and section 4.2 of Act 38-2017, as amended, known as the Uniform Administrative Procedures Act of the Government of Puerto Rico, 3 L.P.R.A. § 9672.

If the Applicant fails to file a Reconsideration Request directly with a program, or to contest a determination under the Administrative Adjudicative Procedure with PRDOH or its Subrecipient, within the time allotted, the inaction will be deemed as an acceptance of the program determination.

~~As per 83 FR 5844, 5850-5851, homeowners and small business owners may challenge construction work that does not meet the established standards as outlined in this Action Plan and in program specific guidelines. As part of the Home Seismic Rehabilitation and Reconstruction Program, PRDOH or its Subrecipient will ensure that construction warranties are in place to the extent required by HUD.~~

~~Individuals seeking more information regarding this and other issues may contact PRDOH at:~~

- ~~Via telephone: (787) 274-2527~~
- ~~Via email at infoCDBG@vivienda.pr.gov~~
- ~~Online at https://cdbg-dr.pr.gov/en/contact/~~
- ~~In writing at:~~

  ~~Puerto Rico CDBG-DR Program~~
  ~~P.O. Box 21365~~
  ~~San Juan, PR 00928-1365~~

Elevation Standards

Elevation is not a standalone activity in this CDBG-DR Program but shall be included as a resiliency measure for structures receiving assistance through the Home ~~Seismic Rehabilitation and~~ Repair, Reconstruction or Relocation Program and shall only be applied when it is required and feasible to mitigate future flood risk and protect federal investment. PRDOH will apply elevation standards for reconstruction, repair of substantially damaged structures, or substantial improvements to residential structures in flood hazard areas, such that the lowest floor is at least 2 feet above the one percent (1%) annual floodplain elevation (or ABFE +2), as outlined in the 87 FR 6364, 6372 ~~83 FR 5844, 5865~~. PRDOH will document when elevation, as opposed to alternative strategies, is cost reasonable to promote a community's long-term recovery as part of the Program.

Elevation and flood insurance requirements will be put into place for all applicable program assistance to structures in the floodplain.

Quality Construction Standards

PRDOH will implement construction methods that emphasize quality, durability, energy efficiency, sustainability, and mold resistance. All reconstructed and newly constructed

homes will be designed to incorporate principles of sustainability, including water and energy efficiency, resilience, and mitigation against the impact of future shocks and stressors.

Residential construction performed under the program will, at a minimum, adhere to the Puerto Rico Codes 2018, Regulation No. 9049, as adopted on November 15, 2018,[54] and must comply with the federal accessibility requirements. Exceptions may be reviewed on a case-by-case basis. Importantly, the Code includes requirements regarding earthquake loads. This is vital, as Puerto Rico must build structures that are resilient to other potential natural hazards. This is consistent with the goal of protecting people and property from harm; emphasizing high quality, durability, energy efficiency, sustainability, and mold resistance; supporting the adoption and enforcement of modern and/or resilient building codes and mitigation of hazard risks, including possible sea level rise, high winds, hurricane storm surge, and flooding, where appropriate; and implementing and ensuring compliance with the Green Building standards as follows.

The Green Building Standard means that PRDOH will require that all applicable construction meets an industry-recognized standard that has achieved certification under at least one (1) of the following programs:

(i) ENERGY STAR (Certified Homes or Multifamily High-Rise),
(ii) Enterprise Green Communities,
(iii) LEED (New Construction, Homes, Midrise, Existing Buildings Operations and Maintenance, or Neighborhood Development),
(iv) ICC–700 National Green Building Standard,
(v) EPA Indoor AirPlus (ENERGY STAR prerequisite),
(vi) the "Permiso Verde," or
(vii) any other equivalent comprehensive green building program acceptable to HUD. PRDOH will identify which Green Building Standard will be used in the program policies and procedures, as per HUD requirements.

Where feasible, Puerto Rico will follow best practices such as those provided by the U.S. Department of Energy's Guidelines for Home Energy Professionals. For all reconstructed and newly constructed structures, this may require installed appliances to meet ENERGY STAR certification standards at a minimum.

Fair Housing

With this opportunity to rebuild, Puerto Rico will increase housing opportunities and affirmatively promote housing choice throughout the housing market. Program implementation will be conducted in a manner which will not cause discrimination on the basis of race, color, religion, sex, disability, familial status, or national origin.

[54] Permits Management Office (OGPe, by its Spanish Acronym), Puerto Rico Codes 2018, Regulation No. 9049 (November 15, 2018) http://app.estado.gobierno.pr/ReglamentosOnLine/Reglamentos/9049.pdf. ~~https://jp.pr.gov/Portals/0/Construction%20Code/ICC%20Codes/Puerto_Rico_Codes_2018.pdf?ver=2018-11-28-133126-680~~

PRDOH will consider the impact of planning decisions on racial, ethnic, and low-income concentrations. This may include utilizing mapping tools and data to identify racially or ethnically concentrated areas of poverty for the evaluation of possible impacts to those areas as well as to promote fair housing choice and foster inclusive communities. All of this leveraging geospatial analysis on Puerto Rico Racially and Ethnically Concentrated Areas of Poverty (R/ECAPs), developed as part of the CDBG-MIT assessments.

PRDOH, subrecipients, contractors and other program partners must comply with applicable federal civil rights, fair housing, and equal opportunity laws, statutes, and executive orders. PRDOH will conduct regular training sessions for all CDBG-MIT and CDBG-DR staff, subrecipients, and contractors to ensure all parties understand and comply with relevant fair housing and civil rights requirements.

PRDOH is responsible for ensuring that programs are designed and implemented in a manner that complies with the requirements set forth in the Fair Housing and Equal Opportunity (**FHEO**) Policy for CDBG-DR Programs[55]. The FHEO Policy for CDBG-DR Programs as well as all General Policies are available in English and Spanish at https://www.cdbg-dr.pr.gov/en/resources/policies/general-policies/ and https://www.cdbg-dr.pr.gov/recursos/politicas/politicas-generales/.

PRDOH is available to provide technical assistance to any program office, subrecipient or contractor requesting support in ensuring that they are sufficiently complying with requirements to affirmatively further fair housing, provide equal opportunity, and comply with all civil rights requirements.

Feasibility and Cost Reasonableness

Puerto Rico will review all projects for feasibility through cost-benefit analysis or comparison of repair costs plus mitigation measures versus reconstruction to the highest resiliency standard. HUD exempts disaster-damaged units that meet the grantee's definition of "not suitable for rehabilitation" from one-for-one replacement requirements. Before carrying out activities that may be subject to the one-for-one replacement requirements, PRDOH must define "not suitable for rehabilitation" in its Action Plan or in policies/procedures governing those activities. PRDOH will define "not suitable for rehabilitation" in its policies/ procedures.

Procurement procedures pertaining to the acquisition of materials and services will be reviewed for compliance with 2 C.F.R. Part 200 Cost Principles including: necessary costs, cost reasonableness standards, allowable costs, and cost allocability.

Broadband Infrastructure

As per requirements of the Federal Register, any substantial rehabilitation, as defined by 24 C.F.R. § 5.100, or new construction of a building with more than four (4) rental units must include installation of broadband infrastructure, except where it is documented

[55] The PRDOH Fair Housing and Equal Opportunity (FHEO) Policy for CDBG-DR Programs has been developed for previous CDBG-DR programs and will carry through into implementation of the CDBG-DR Earthquake Program.

that: (a) The location of the new construction or substantial rehabilitation makes installation of broadband infrastructure infeasible; (b) the cost of installing broadband infrastructure would result in a fundamental alteration in the nature of its program or activity or in an undue financial burden; or (c) the structure of the housing to be substantially rehabilitated makes installation of broadband infrastructure infeasible.

Program Budget

The program budget outlines how funds will be spent. PRDOH will comply with the requirement that not less than eighty percent (80%) of the funds provided under the Notice must address unmet disaster needs or mitigation activities within the "most impacted and distressed" counties identified in 87 FR 6364 ~~the 83 FR 5844, 584~~5 and not less than seventy percent (70%) of the aggregate of CDBG-DR program funds to support activities benefitting LMI persons.

The program budget aligns with the categories identified in the unmet needs assessment, with the majority of funds designated for Housing activities in LMI households within the MID areas. Pursuant to the applicable Federal Register Notices, each grantee receiving an allocation for a 2018 or 2019 disaster is required to primarily consider and address its unmet housing recovery needs. PRDOH may, however, propose the use of funds for unmet economic revitalization and infrastructure needs unrelated to the grantee's unmet housing needs if the grantee demonstrates in its needs assessment that there is no remaining unmet housing need or that the remaining unmet housing need will be addressed by other sources of funds.[56]

Any amendments to the Action Plan will take place in conformity with HUD requirements. Nonsubstantial amendments addressing minor administrative changes will be presented to HUD five (5) days prior to being incorporated into the comprehensive Action Plan. Substantial amendments addressing alterations to the Action Plan such as change to program benefit or eligibility criteria, the addition or deletion of an activity, or the allocation or reallocation of more than 10% of grant funds will be publicly posted for no less than thirty (30) days, or as otherwise indicated in the Citizen Participation Plan, to allow public input before finalizing and incorporating into the comprehensive Action Plan. Amendments to this Action Plan will be incorporated into one comprehensive document and tracked chronologically in a version control log.

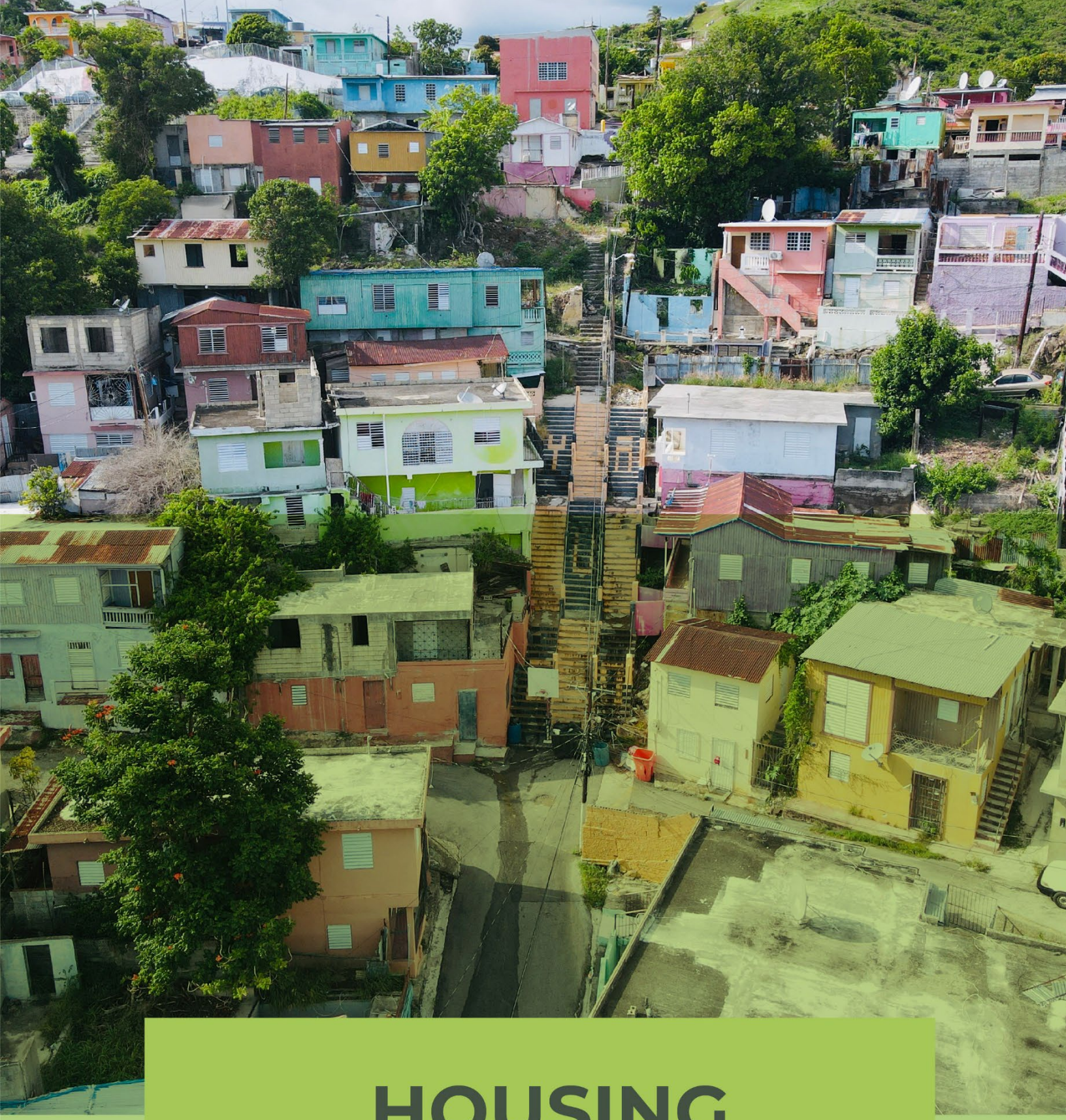
[56] As per the Federal Register Notice 86 FR 569, 570.

PROGRAM BUDGET

Program	Budget	% Total Budget	% LMI Goal
HOUSING PROGRAM Housing Seismic Rehabilitation and Reconstruction	**$34,420,680.00**	**94.5%**	**100%**
ADMINISTRATIVE Administrative Budget	**$1,821,200.00**	**5.0%**	**N/A**
PLANNING Program Planning (Internal)	**$182,120.00**	**0.5%**	**N/A**
Total	**$36,424,000.00**	**100%**	

LMI Goal	Total	% Programmatic Budget
Programmatic LMI Goal	**$34,420,680.00**	**100%**

	% LMI Goal	First Allocation	Second Allocation	Total
CDBG-DR Programs				
Home Repair, Reconstruction and Relocation Program	100%	$34,420,680.00	$145,639,570.00	**$180,060,250.00**
Mitigation Set-Aside	100%	$0.00	$28,832,000.00	**$28,832,000.00**
Non-Program Budget				
Administrative (5%)		$1,821,200.00	$9,231,300.00	**$11,052,500.00**
Program Planning (0.5%)		$182,120.00	$923,130.00	**$1,105,250.00**
Total		**$36,424,000.00**	**$184,626,000.00**	**$221,050,000.00**



HOUSING PROGRAM

HOME ~~SEISMIC~~ ~~REHABILITATION~~, ~~AND~~ REPAIR, RECONSTRUCTION, AND RELOCATION PROGRAM

PROGRAM BUDGET	ADMINISTERING ENTITY	NATIONAL OBJECTIVE
~~$34,420,680.00~~ $208,892,250	PRDOH and ConSur	100% LMI
MAX AWARD	**START – END DATE**	**ELIGIBLE AREA**
~~$185K~~ $215K RECONSTRUCTION ($265,500 FOR CASES OF ELEVATION) **$60K ~~REHABILITATION~~ REPAIR**[57] **$200K RELOCATION** **$30K PV & WATER STORAGE SYSTEMS**	DURATION OF THE GRANT	GUÁNICA, YAUCO, GUAYANILLA, ~~and~~ PONCE, LAJAS, PEÑUELAS, AND MAYAGÜEZ (00680)[58] (HUD-IDENTIFIED MID)

EARTHQUAKES IMPACT (DR-4473-PR)

On January 16, 2020, the Federal Government determined ~~that~~ the damage in certain areas of ~~the Commonwealth of~~ Puerto Rico resulting from earthquakes beginning on December 28, 2019, and that ~~have~~ continued with aftershocks ~~for the following~~ several months after, was of sufficient severity and magnitude to warrant a major disaster declaration under the Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C. 5121 et seq. (the "Stafford Act"). Therefore, the major disaster declaration for Puerto Rico was issued and subsequently identified under ~~with~~ FEMA disaster number-DR-4473-PR. As of May 2020, HUD identified a total serious unmet need of $29,748,906 for the housing sector in the MID area.

IMPACT FROM TROPICAL STORM ISAÍAS (DR-4560-PR)

Tropical Storm Isaías impacted Puerto Rico by damaging homes as a storm and rainfall event that occurred from July 29-31, 2020. The storm was declared a major disaster event by FEMA on September 9, 2020, and became cataloged by FEMA as DR-4560-PR. HUD included assistance for Tropical Storm Isaías impact in 87 FR 6364, published on February 3, 2022.

[57] The word rehabilitation is being replaced with the word repair throughout this document for consistency purposes.
[58] Mayagüez set-aside will address unmet recovery needs from the impact of Tropical Storm Isaías (DR-4560-PR). HUD has identified zip code 00680 as the most impacted and distressed area. *See* 87 FR 6364, 6563.

ELIGIBLE ACTIVITIES
Pursuant to the HCDA, the following are eligible activities:

- Section 105(a)(1) – Acquisition of Real Property
- Section 105(a)(4) – ~~Housing Reconstruction, Rehabilitation, Clearance, Demolition, Green Building Standards~~. Clearance, demolition, removal, reconstruction, and rehabilitation (including rehabilitation which promotes energy efficiency) of buildings and improvements[59]
- Section 105(a)(7) – Disposition of Real Property
- Section 105(a)(8) - Public Services
- Section 105(a)(11) – Relocation Payments for displaced individuals
- Section 105(a)(20) – Housing Counseling Services
- Section 105(a)(24) – Homeownership Assistance

PROGRAM PRIORITY

- Applicants with significant property damage: At the time of application, if the applicant's home remains significantly damaged, or destroyed, the applicant may qualify for prioritization.[60]

ELIGIBILITY

- Confirmed damage to property due to the earthquakes; or confirmed damage to property due to Tropical Storm Isaías; or non-code-compliant structure within radius of other properties with confirmed damage to property due to the earthquakes.
- Ownership of property structure (alternative methods)[61]
- Must qualify as low or moderate income (below 80% Area Median Family Income),
- Must be an eligible single-family structure,
- Must have occupied the property as a primary residence at the time of the ~~earthquakes~~ applicable disaster.

AWARD

- **Min Award**: Based on cost feasibility analysis.
- ~~**Rehabilitation**~~ **Repair Max Award**: $60,000
- **Relocation Max Award**: $200,000
- **Reconstruction Max Award**: ~~$185,000~~ $215,000~~; $265,500 for elevation (to include reconstruction max of $185,000.00 + elevation costs + demolition and debris removal).~~

[59] This eligible activity remains the same. Language has been revised to better describe this eligible activity from the HCD Act.
[60] Note: These priorities may be operational for certain time periods as designated in the Program Guidelines.
[61] Alternative proof of ownership may include a Title Certification (*Certificación de Titularidad*) as defined by Executive Order OE-2020-063.

- **PV Systems and Water Storage Systems**: $30,000

Costs in excess of Program caps may be permissible and will be evaluated on a case-by-case basis for items such as: reasonable elevation, environmental abatement or unique site-specific costs, when necessary, which may also include utility connection costs. Exceptions to the caps may also consider necessary household composition requirements, accessibility features, historic preservation, or current market conditions.

Additionally, exceptions to the max award will be considered when necessary to comply with federal accessibility standards or to reasonably accommodate a person with functional diversity.

METHOD OF DISTRUBUTION
Direct and/or Subrecipient Distribution Model

PRDOH has selected ConSur as a subrecipient for this program. ConSur is a consortium of Ponce, Guayanilla, Yauco, Guánica, Lajas, and Peñuelas municipalities. With PRDOH assistance, ConSur will manage the distribution of funds within these southern municipalities identified as the MID-area for the earthquake event.

PRDOH may provide direct assistance to beneficiaries in the Tropical Storm Isaías impacted area.

NATIONAL OBJECTIVE
LMI – 100%

PROGRAM OBJECTIVE AND DESCRIPTION
The ~~Home Seismic Rehabilitation and Reconstruction Program (**SR2**)~~ Home Repair, Reconstruction, or Relocation (**R3**) Program provides assistance to homeowners to repair damaged homes or rebuild substantially damaged homes in place. Reconstruction activity returns otherwise displaced families to their homes in their same community. Homes become eligible for reconstruction when the property estimated cost of repair exceeds $60,000 as confirmed through program inspection, the property is determined to be substantially damaged by an authority having jurisdiction, or a feasibility inspection determines that reconstruction is required. Homes meeting this damage threshold will be reconstructed to include resilient measures in structural materials. Homes that may not be rebuilt in place due to legal, engineering, or environmental constraints (permitting, extraordinary site conditions, etc.) will not be reconstructed and the homeowner will be provided relocation options. ~~Applicants whose homes cannot be rebuilt due to any of these reasons may be referred to the Single-Family Housing Mitigation Program under the Puerto Rico CDBG-MIT Program for housing alternatives such as voluntary relocation. For more information about this CDBG-MIT Program, please visit the webpage: https://cdbg-dr.pr.gov/en/cdbg-mit/~~ At the time it is determined that a homeowner is eligible for relocation, the R3 Program will make available housing counseling services to the

homeowner to inform the applicant of available housing options and information to assist the applicant in making an informed decision regarding housing options available under the relocation option. Additionally, the R3 Program provides homeowners whose homes suffered more than $60,000 in damages the opportunity to relocate by forgoing a reconstruction award and accepting a relocation voucher.

For reconstruction and relocation activities, the homeowner must agree to own the home and use it as their primary residence for a period of five (5) years after reconstruction or successful relocation, as secured through a Sworn Grant Agreement in compliance with Rule 35.4 of the Puerto Rico Civil Procedure Rules, 32 L.P.R.A. Ap. V, R.35.4 (Entry of Judgement by Confession). Additionally, for relocation activities, the homeowner and PRDOH will execute a Direct Mortgage Deed with Imposition of Restrictive Covenants, which shall be recorded in the Puerto Rico Property Registry. The latter is a unit of the Puerto Rico Department of Justice. If a homeowner moves, sells, leases, transfers, exchanges, donates, vacates, abandons, or otherwise alienates the property within the first five (5) years, the entire (100%) amount of the benefit received must be repaid in full to PRDOH. If a homeowner moves, sells, leases, transfers, exchanges, donates, vacates, abandons, or otherwise alienates the property during the affordability period, the amount of benefit that must be repaid will be determined by the straight-line, linear amortization schedule for the remaining years as established by the Program in the Applicant's Grant Agreement.

For ~~rehabilitation~~ repair activities only, the ownership and occupancy compliance period will be three (3) years ~~as secured through a Sworn Grant Agreement in compliance with the above-mentioned Rule 35.4, supra~~ calculated from the final completion date, according to the terms and conditions as established in Applicant's Grant Agreement. If a homeowner moves, sells, leases, transfers, exchanges, donates, vacates, abandons, or otherwise alienates the property within the first three (3) years, the entire (100%) amount of the benefit received must be repaid in full to PRDOH. Further information about program award requirements, occupancy and residency periods, ongoing monitoring during compliance periods, and/or applicant responsibilities related to acceptance of the Program assistance will be further developed in Program Guidelines that will be published in English and Spanish at: https://cdbg-dr.pr.gov/en/ and https://cdbg-dr.pr.gov/. Temporary relocation assistance may be available for applicants while program sponsored construction is underway, or on a case-by-case basis as determined by the Program.

Mitigation Activities (Mitigation Set-aside)

The assessment of risk and unmet needs shows that the earthquake impacted areas remain vulnerable to ongoing seismic and other threats such as liquefaction. There may be homes that were not directly damaged by the earthquake events yet are within the area of impact and are not code compliant as currently constructed. This places these homeowners at continued risk because their housing structure may not withstand future disaster events, leading to risk of loss of life and property damage. Homes that are within

a reasonable proximity to other earthquake impacted homes, as defined in the program guidelines, and are not code compliant, and for which the homeowner meets eligibility criteria, may be mitigated against seismic threats by either retrofitting as a repair or reconstructing to code.

The Appropriations Act requires the use of 15% of the allocated CDBG-DR funds for mitigation activities. As stated in the allocation notice, "mitigation activities are defined as those activities that increase resilience to disasters and reduce or eliminate the long-term risk of loss of life, injury, damage to and loss of property, and suffering and hardship, by lessening the impact of future disasters."[62] Consequently, PRDOH may also meet the requirement of the CDBG–DR mitigation set-aside by including eligible recovery activities that both address the impacts of the qualified disaster, and incorporate mitigation measures into the recovery activities.[63] PRDOH will report mitigation activities expenditures as such in DRGR so that HUD and the public have visibility over compliance with this requirement.

Flood Insurance

As per Federal regulations, a HUD-assisted homeowner of a property located in a Special Flood Hazard Area must obtain and maintain flood insurance in the amount and duration prescribed by FEMA's National Flood Insurance Program. Section 102(a) of the Flood Disaster Protection Act of 1973 (42 U.S.C. 4012a) mandates the purchase of flood insurance protection for any HUD-assisted property within a Special Flood Hazard Area. Section 582 of the National Flood Insurance Reform Act of 1994, as amended, (42 U.S.C. 5154a) prohibits flood disaster assistance in certain circumstances. In general, it provides that no Federal disaster relief assistance made available in a flood disaster area may be used to make a payment to a person for ''repair, replacement, or restoration'' for damage to any personal, residential, or commercial property if that person at any time has received Federal flood disaster assistance that was conditioned on the person first having obtained flood insurance under applicable Federal law and the person has subsequently failed to obtain and maintain flood insurance as required under applicable Federal law on such property. This means that a PRDOH may not provide disaster assistance for the repair, replacement, or restoration of a property to a person who has failed to meet this requirement and must implement a process to check and monitor for compliance.[64]

Primary Residence

Applicants must prove primary residency at the time of the 2019-2020 Southwest Puerto Rico earthquake sequence or the Tropical Storm Isaías, as applicable. Secondary or vacation homes are not eligible for assistance through this program. PRDOH or its Subrecipient will work to reasonably accommodate households with non-traditional documentation validating both ownership and residency. Documentation used to verify

[62] 87 FR 6364, 6367
[63] Id.
[64] ~~83 FR 5844, 5865~~ Id.

a primary residence may include a variety of documentation including, but not limited to, tax returns, homestead exemptions, driver's licenses, and utility bills when used in conjunction with other documents. Applicants may be required to prove primary residency by providing documentation validating occupancy for consecutive weeks and/or months leading up the time of the applicable disaster ~~earthquakes~~. To the extent feasible, PRDOH or its Subrecipient will validate ownership and/or primary residency through electronic verification utilizing locally or federally maintained registries. After conducting a due-diligence process, the Program may also allow alternative methods for documenting ownership, including an affidavit process.

MID AREAS SET ASIDE: This Program include ~~four (4)~~ seven (7) set-asides, one for each Municipality, ~~based on the proportion presented by HUD as Serious Unmet Housing Need Estimate MID Area~~ determined by averaging the FEMA reported Repair and Replacement Amounts estimates for disasters DR4473 (Earthquakes) and DR4560 (Tropical Storm Isaías) between the awarded Municipalities.[65] To assure distribution of all funds, PRDOH reserves the right to reallocate funds between set-asides.

~~***Table 23: Set Asides based on HUD-identified MID Areas***~~

~~MID MUNICIPALITY SET ASIDE~~	~~PROGRAM BUDGET SET-ASIDE~~	~~% OF PROGRAM BUDGET ASSIGNED*~~
~~**Ponce Set Aside**~~	~~$3,807,829.70~~	~~*11.06%*~~
~~**Guayanilla Set Aside**~~	~~$4,173,824.65~~	~~*12.13%*~~
~~**Yauco Set Aside**~~	~~$10,748,174.47~~	~~*31.23%*~~
~~**Guánica Set Aside**~~	~~$15,690,851.18~~	~~*45.59%*~~
~~**TOTAL PROGRAM BUDGET**~~	~~**$34,420,680.00**~~	~~**100.00%**~~
~~* ***The percentages used to distribute the allocation of funds between the HUD MID identified municipalities is the same as used by HUD in their formula.***~~		

Table 2724: Set Asides based on HUD-identified MID Areas

	First Allocation	Second Allocation	Total	Allocation Percentage*
Home Repair, Reconstruction and Relocation Program	$34,420,680.00	$145,639,570	$180,060,250	N/A
Mitigation Set-Aside**	-	$28,832,000	28,832,000.00	N/A

[65] ~~HUD report on unmet needs allocations methodology "Allocation of CDBG–DR Funds to Most Impacted and Distressed Areas due to 2018 and 2019 Federally Declared Disasters". Information provided by HUD to PRDOH on March 3, 2021.~~

	First Allocation	Second Allocation	Total	Allocation Percentage*
Total Program Budget	**$34,420,680.00**	**$174,471,570**	**$208,892,250**	**N/A**
Ponce Set Aside	$3,807,829.70	$36,639,029.70	$40,446,859.40	**21.00%**
Guayanilla Set Aside	$4,173,824.65	$20,936,588.40	$25,110,413.05	**12.00%**
Yauco Set Aside	$10,748,174.47	$36,639,029.70	$47,387,204.17	**21.00%**
Guanica Set Aside	$15,690,851.18	$48,852,039.60	$64,542,890.78	**28.00%**
Lajas Set Aside	$0.00	$10,468,294.20	$10,468,294.20	**6.00%**
Peñuelas Set Aside	$0.00	$10,468,294.20	$10,468,294.20	**6.00%**
Mayagüez (00680)	$0.00	$10,468,294.20	$10,468,294.20	**6.00%**

**** The percentages used to distribute the allocation of funds between the HUD MID identified municipalities was determined averaging the FEMA reported Repair and Replacement Amounts estimates for disasters DR4473 (Earthquakes) and DR4560 (Isaias Storm) between the awarded Municipalities.***
*****As allowed in 87 FR 6364, 6367, PRDOH will incorporate mitigation measures into the recovery activities.***

~~APPLICATION STATUS~~

~~For the complete description regarding Applicant Communication and Application Status Updates, please see the section of the same name on this Action Plan. In addition to program specific protocol for application status updates as published in Program Guidelines, when those become available, applicants may contact PRDOH or the Program Subrecipient to request information. PRDOH may be contacted at the contact information below:~~

• ~~Via telephone:~~	~~1-833-234-CDBG or 1-833-234-2324 (TTY: 787-522-5950)~~ ~~Attention hours: Monday to Friday from 8:00am-5:00pm~~
• ~~Via email at:~~	~~infoCDBG@vivienda.pr.gov – for all CDBG-DR inquiries~~
• ~~Online at:~~	~~https://cdbg-dr.pr.gov/en/contact/ (English version)~~ ~~https://www.cdbg-dr.pr.gov/contact/ (Spanish version)~~
• ~~In writing at:~~	~~Puerto Rico CDBG-DR Program~~ ~~P.O. Box 21365~~ ~~San Juan, PR 00928-1365~~

~~QUALITY CONSTRUCTION AND GREEN BUILDING STANDARDS~~

~~PRDOH will implement construction methods that emphasize quality, durability, energy efficiency, sustainability, and mold resistance. All homes that are reconstructed in place will be designed to incorporate principles of sustainability, including water and energy efficiency, resilience, and mitigation against the impact of future shocks and stressors.~~

~~The Green Building Standard means that PRDOH will require that all applicable construction meets an industry-recognized standard that has achieved certification under at least one (1) of the following programs: (i) ENERGY STAR (Certified Homes or Multifamily High-Rise), (ii) Enterprise Green Communities, (iii) LEED (New Construction, Homes, Midrise, Existing Buildings Operations and Maintenance, or Neighborhood Development), (iv) ICC–700 National Green Building Standard, (v) EPA Indoor AirPlus (ENERGY STAR a prerequisite), (vi) the "Permiso Verde," or (vii) any other equivalent comprehensive green building program acceptable to HUD. PRDOH will identify which Green Building Standard will be used in the program policies and procedures, as per HUD requirements.~~

~~Where feasible, Puerto Rico will follow best practices such as those provided by the U.S. Department of Energy's Guidelines for Home Energy Professionals. For all reconstructed structures, this may require installed appliances to meet ENERGY STAR certification standards at a minimum.~~

~~ELEVATION STANDARDS~~

~~As required in 83 FR 5844, 5861, PRDOH will apply elevation standards for single family housing structures located in the Advisory 100-year (or one percent (1%) annual chance) floodplain to require that homes elevated, or reconstructed and elevated, raise the lowest floor (including the basement) to at least two (2) feet above the base flood elevation (**BFE**).~~

~~Homeowners applying for elevation must be aware that the option for elevation will be contingent upon a feasibility analysis to consider, at a minimum:~~

- ~~Whether elevating a home in place leaves the homeowner vulnerable to limited evacuation routes in the event of a disaster, thereby not removing a homeowner from harm's way;~~
- ~~Whether the cost of elevating a home is at or below thirty percent (30%) of the cost for a newly constructed home in place for an original home that can be raised;~~
- ~~Whether or not raising a home to the BFE plus two (2) feet is feasible when considering the potential for transferring flood risk to the surrounding neighborhood; and/or~~
- ~~Whether the home parcel permits enough space for stair and/or rampway access.~~

~~The housing stock in Puerto Rico is generally more resilient to floods when compared to the construction of homes in many floodplain areas of the mainland U.S. Most Puerto Rican homes are poured concrete, slab-on-grade, with concrete roofs, which are sturdier and resistant to structural damage by floodwaters. Several feet of floodwater in a~~

~~concrete house with no drywall, subfloor, or insulation will effect much less damage than the same height of floodwater in a wooden home with drywall and insulation.[66] This standard of construction, however, and the close proximity of Puerto Rican homes must be taken into consideration as these factors may complicate the potential for elevation options and could create safety concerns at the neighborhood level by adversely impacting flood patterns.~~

~~Homes determined eligible at the conclusion of the feasibility analysis will proceed forward with the eligibility process. Poured concrete, slab-on-grade homes will likely require reconstruction of the home to minimize cost and ensure safety of the home structure. Homes located in the floodway will not be eligible for elevation. If elevation is determined to be infeasible, the property owner will be provided an alternative option for relocation.~~

~~Duplication of Benefits (**DOB**)~~

~~In accordance with the Robert T. Stafford Act, as amended, Puerto Rico will implement policies and procedures to ensure no individual receives duplication of benefit for the same purpose and/or effect to recover from the earthquakes. Federal law prohibits any person, business concern, or other entity from receiving federal funds for any part of such loss as to which he has received financial assistance under any other program, from private insurance, charitable assistance or any other source.~~

~~If eligible and awarded, housing assistance award calculations are based on the following factors: damage/scope of project work needed; a review of funding from all sources to ensure no DOB; and availability of DOB funds, if any, for use in the project. Housing assistance awards will be determined after factoring in the inputs listed above, subtracting any unaccounted-for DOB, and then factoring in the pre-determined program caps that apply to the particular housing assistance activities to be used.~~

~~Applicant awardees must subrogate any additional funds received for damage caused by the earthquakes back to the housing program. CDBG-DR funds must be funding of last resort and if additional funds are paid to applicant awardees for the same purpose as the housing assistance award they receive through PRDOH assistance (i.e., repair or replacement of the damaged structure) after PRDOH has completed the repair/rehabilitation project, those funds must be returned to PRDOH.~~

[66] *Residential Flood Insurance in Puerto Rico,* Wharton Risk Center Issue Brief, March 2018. Accessed at: https://riskcenter.wharton.upenn.edu/wp-content/uploads/2018/03/WRCib2018_Flood-Insurance-in-Puerto-Rico.pdf.

CITIZEN PARTICIPATION

CITIZEN PARTICIPATION

The citizen participation protocols described in this Action Plan are further detailed in the PRDOH Citizen Participation Plan, which provides all Puerto Rican residents with an opportunity to participate in the planning and assessment of the PRDOH's CDBG-DR programs.

Methods for Citizen Participation

The following paragraphs describe methods that will be used for citizen participation in relation to the CDBG-DR programs. The methods described are not intended to be exclusive of other methods of citizen participation allowed by HUD.

Methods and Opportunities for Citizen Involvement:

- Public Hearings;
- Communication via the Internet;
- Information via the PRDOH Website;
- Citizen Advisory Committee(s);
- Participatory Engagement; and
- Other Methods for Citizen Participation

Through these methods, citizens may receive information about the following:

- The amount of assistance available to impacted communities;
- The range of eligible activities to be undertaken;
- Performance reports;
- Action Plan and Action Plan Amendments and comment periods;
- Program information, including how to request additional information;
- Upcoming Public Hearings, Webinars or other stakeholder sessions;
- The Citizen Advisory Committee, including its Subcommittees;
- Information to request and receive technical assistance;
- How to comment on the Citizen Participation Plan; and
- How to file a complaint.

Communication for Individuals with Disabilities

PRDOH is committed to ensuring that citizens with disabilities also have effective means to participate and communicate with PRDOH. Consequently, PRDOH will also effectively communicate with citizens with disabilities regarding Action Plans, policies and procedures. Interpretation services for sign language will be made available at Public Hearings. Notices for public meetings will include contact information for requesting accessible communication aids or services. Requests for communication aids or services should be requested at least **forty-eight (48) hours** in advance of the public meeting so that PRDOH has a reasonable opportunity to coordinate the provision of the requested

aids or services. PRDOH will make every reasonable effort to honor requests received with less than **forty-eight (48) hours** of advance notice of a public meeting.

The Action Plan and other materials on the PRDOH website are provided in accessible formats, including those readable by screen readers to provide accessibility to the visually impaired. PRDOH will meet communications requirements at 24 C.F.R. §8.6 and other Fair Housing and civil rights requirements, such as the effective communication requirements under the Americans with Disabilities Act of 1990.

The CDBG-DR Fair Housing and Equal Opportunity Policy and its appendices, will be posted along with all CDBG-DR Program policies in English and Spanish at https://www.cdbg-dr.pr.gov/en/resources/policies/general-policies/ and https://www.cdbg-dr.pr.gov/recursos/politicas/politicas-generales/. The same Fair Housing and Equal Opportunity Policy shall be adopted for this CDBG-DR Program for earthquake and Tropical Storm Isaías disaster recovery.

Program accessibility for individuals with disabilities may be requested at:

- Via telephone: 1-833-234-CDBG o 1-833-234-2324 (TTY: 787-522-5950)
  Attention hours: Monday to Friday from 8:00am-5:00pm
- Via email at: infoCDBG@vivienda.pr.gov – for all CDBG-DR inquiries, or
  CDBG-MIT@vivienda.pr.gov – for all CDBG-MIT inquiries
- Online at: https://www.cdbg-dr.pr.gov/en/contact/ (English version)
  https://www.cdbg-dr.pr.gov/contact/ (Spanish version)
- In writing at: Puerto Rico CDBG-DR Program/CDBG-MIT Program
  P.O. Box 21365
  San Juan, PR 00928-1365

Citizen Involvement in the Original Action Plan

The original Action Plan ~~will be~~ was posted in English and Spanish ~~to~~ in the PRDOH program website https://cdbg-dr.pr.gov/en/ and https://cdbg-dr.pr.gov/ to allow an opportunity for public comment for ~~no less than~~ **thirty (30) calendar days** for CDBG-DR, as required by 86 FR 569, 572 ~~and 83 FR 40318~~. The posting ~~will also be~~ was communicated via e-mail, and/or postal mail, to non-profit organizations who work with vulnerable populations, municipalities, elected officials, and others, and ~~will be~~ announced through the PRDOH social media site on Facebook. PRDOH will consider comments on the Action Plan or substantial amendments received in writing, via email, verbally via the Call Center or expressed in-person or at official public hearing events.

Additionally, in an effort to permit public examination and accountability, PRDOH will make formal comments regarding Action Plans or substantial amendments publicly available at https://www.cdbg-dr.pr.gov/en/action-plan/ in English and at https://www.cdbg-dr.pr.gov/plan-de-accion/ in Spanish. PRDOH responses to comments regarding Action Plans or substantial amendments will also be posted to the

website. PRDOH will submit the summary of these comments or views, and its response to each comment to HUD with the Action Plan or substantial amendment.

Citizens accessing information via the CDBG-DR website in English and Spanish at https://cdbg-dr.pr.gov/en/ and https://cdbg-dr.pr.gov/ and who are seeking to comment on the CDBG-DR Action Plan will be directed to the Action Plan links for public comment as outlined above.

The most current version of the approved Action Plan, including any substantial amendments, will be posted as a single document and located at: https://www.cdbg-dr.pr.gov/en/action-plan/ in English and https://www.cdbg-dr.pr.gov/plan-de-accion/ in Spanish. Posting the Action Plan and any amendments as a single document allows the public to view the Action Plan as a whole, rather than the public having to view and cross-reference changes among multiple amendments. Citizens who cannot access the Action Plan or proposed substantial amendments through the website may request assistance from PRDOH:

- Via telephone: 1-833-234-CDBG or 1-833-234-2324 (TTY: 787-522-5950)
  Attention hours: Monday to Friday from 8:00am-5:00pm
- Via email at: infoCDBG@vivienda.pr.gov – for all CDBG-DR inquiries
- Online at: https://www.cdbg-dr.pr.gov/en/contact/ (English version)
  https://www.cdbg-dr.pr.gov/contact/ (Spanish version)
- In writing at: Puerto Rico CDBG-DR Program
  P.O. Box 21365
  San Juan, PR 00928-1365

Citizen Involvement in the Substantial Amendment Process

Substantial amendments are subject to a **thirty (30) calendar day** public comment period and shall be posted to the PRDOH website where citizens will also be able to submit electronic comments, or follow instructions for submitted written comments, by alternative means listed on the website.

Citizen participation for substantial amendments to the Action Plan will follow this PRDOH Citizen Participation Plan. Changes made via substantial amendments to the Action Plan will be highlighted or otherwise identified within the context of the entire Action Plan. As required by 87 FR 6364 ~~83 FR 5844, 5852~~ every substantial amendment will include the following:

- A section that identifies what content is being added, deleted or changed;

- Chart or table that clearly illustrates where funds are coming from and where they are moving to; and
- Revised budget allocation table that reflects all funds.

A substantial amendment is defined as an amendment that contemplates one (1) or more of the following:

- Change in a program benefit or eligibility criteria;
- Addition or deletion of an activity; and
- Allocation or reallocation of more than ten percent (10%) of grant funds.

Non-substantial Amendments to this Action Plan are not subject to a public comment period and will, therefore, follow HUD procedure requiring PRDOH to notify HUD at least **five (5) business days** before the amendment becomes effective. All non-substantial amendments will be posted to the PRDOH public website with changes to the text highlighted in grey.

Consideration of Public Comments

PRDOH will consider comments on the Action Plan or substantial amendments received in writing, via email or verbally via the Call Center. Additionally, in an effort to permit public examination and accountability, PRDOH will make formal comments regarding Action Plans or substantial amendments publicly available at www.cdbg-dr.pr.gov/en/action-plan/ in English and at https://www.cdbg-dr.pr.gov/plan-de-accion/ in Spanish. PRDOH responses to comments regarding Action Plans, or substantial amendments, will also be posted to the website.

Communication via the internet

Public information for CDBG-DR (Earthquake and Tropical Storm Isaías) allocations during Action Plan development can be found on a dedicated page within the CDBG-DR Program website in English and Spanish at https://cdbg-dr.pr.gov/en/ and https://cdbg-dr.pr.gov, respectively. From this page, entity and private citizen stakeholders can find more information, register for program-related notifications, and find a formal announcement for the opening of the CDBG-DR Action Plan public comment period.

The CDBG-DR Action Plan will be posted in its entirety to the CDBG-DR Action Plan and amendments page where all versions of the CDBG-DR Action Plan are currently located and future CDBG-DR Action Plan and amendments will reside in English and Spanish at: https://cdbg-dr.pr.gov/en/action-plan/ and https://www.cdbg-dr.pr.gov/plan-de-accion/, respectively.

Once the CDBG-DR Action Plan is approved by HUD and additional program becomes available, all information will be integrated into the current CDBG-DR site for the Earthquake and Tropical Storm Isaías allocations.

Interested individuals are encouraged to comment at any time by sending an email to infoCDBG@vivienda.pr.gov for CDBG-DR (Earthquake and Tropical Storm Isaías allocations) inquiries. Additionally, citizens may comment by using the "Contact Us" tool included in PRDOH's disaster recovery website. The "Contact Us" tool can be accessed directly at https://cdbg-dr.pr.gov/en/contact-us/ in English and https://cdbg-dr.pr.gov/contactanos/ in Spanish.

As part of the implementation of CDBG-DR Programs, PRDOH will regularly interact with municipalities, NGOs and the citizens of Puerto Rico. These methods may include but are not limited to:

- Web-based surveys
- Coordination with municipalities, non-profit or community organizations, faith-based or other organizations
- Focus groups or interviews
- Other in-person meetings as requested by individuals or organizations.

This Citizen Participation Plan will continue to be updated as programs progress. Citizen comment is welcome on this Plan throughout the duration of this grant. Please contact PRDOH using the following methods:

- Via telephone: 1-833-234-CDBG or 1-833-234-2324 (TTY: 787-522-5950)
  Attention hours: Monday to Friday from 8:00am-5:00pm
- Via email at: infoCDBG@vivienda.pr.gov – for all CDBG-DR inquiries
- Online at: https://www.cdbg-dr.pr.gov/en/contact/ (English version)
  https://www.cdbg-dr.pr.gov/contact/ (Spanish version)
- In writing at: Puerto Rico CDBG-DR Program
  P.O. Box 21365
  San Juan, PR 00928-1365

Performance Report

Program performance reports, such as Quarterly Performance Reports (**QPR**), will be posted at https://www.cdbg-dr.pr.gov/en/reports/ prior to submission to HUD. Citizens will be provided **fifteen (15) calendar** days to comment on performance reports, as required by 24 C.F.R. § 91.115.

Please contact PRDOH using the following methods:

- Via telephone: 1-833-234-CDBG or 1-833-234-2324 (TTY: 787-522-5950)
  Attention hours: Monday to Friday from 8:00am-5:00pm

- Via email at: infoCDBG@vivienda.pr.gov – for all CDBG-DR inquiries
- Online at: https://www.cdbg-dr.pr.gov/en/contact/ (English version)
  https://www.cdbg-dr.pr.gov/contact/ (Spanish version)
- In writing at: Puerto Rico CDBG-DR Program
  P.O. Box 21365
  San Juan, PR 00928-1365

Individuals with Limited English Proficiency

Program materials, including plans and program guidelines, will be available in Spanish and English at https://cdbg-dr.pr.gov/en/ and Spanish https://cdbg-dr.pr.gov/. For access to language access services in languages other than English or Spanish, citizens may contact PRDOH at:

- Via telephone: 1-833-234-CDBG or 1-833-234-2324 (TTY: 787-522-5950)
  Attention hours: Monday to Friday from 8:00am-5:00pm
- Via email at: infoCDBG@vivienda.pr.gov – for all CDBG-DR inquiries
- Online at: https://www.cdbg-dr.pr.gov/en/contact/ (English version)
  https://www.cdbg-dr.pr.gov/contact/ (Spanish version)
- In writing at: Puerto Rico CDBG-DR Program
  P.O. Box 21365
  San Juan, PR 00928-1365

Materials will also be disseminated among program partners, including municipalities, government agencies, non-profit organizations, and NGOs to ensure that these materials are accessible locally.

The CDBG-DR Language Access Plan will be posted, along with all CDBG-DR Program policies, in both English and Spanish languages at ~~URL~~: https://cdbg-dr.pr.gov/en/resources/policies/ and at https://cdbg-dr.pr.gov/recursos/politicas/.

Technical Assistance

PRDOH will provide technical assistance ~~in order~~ to facilitate public participation regarding CDBG-DR Programs, upon request. Technical assistance provided will be determined based on the needs of the community or individual requesting assistance. This technical assistance may be requested at:

- Via telephone: 1-833-234-CDBG or 1-833-234-2324 (TTY: 787-522-5950)
  Attention hours: Monday to Friday from 8:00am-5:00pm
- Via email at: infoCDBG@vivienda.pr.gov – for all CDBG-DR inquiries
- Online at: https://www.cdbg-dr.pr.gov/en/contact/ (English version)
  https://www.cdbg-dr.pr.gov/contact/ (Spanish version)
- In writing at: Puerto Rico CDBG-DR Program/CDBG-MIT Program
  P.O. Box 21365
  San Juan, PR 00928-1365

Accessibility of Information

Information related to PRDOH's CDBG-DR, including Action Plans, Action Plan amendments, program policies and procedures, performance reports, citizen participation requirements, program information, and details of contracts and ongoing procurement policies will be publicly available in English and Spanish at https://www.cdbg-dr.pr.gov/en/ and https://www.cdbg-dr.pr.gov/, respectively. Program information posted to the website ~~will be~~ are accessible and available in both Spanish and English and will be made available in accessible formats, including those readable by screen readers. PRDOH will make information available in alternate formats as needed and upon request, to ensure effective communication to persons with disabilities.

PRDOH may use a variety of communication methods to notify the public of information regarding the CDBG-DR Programs. The methods listed have been used by PRDOH prior to the disaster to communicate information across the Island. The use of these methods varies based on region and municipality. In addition to these methods of outreach and an active online presence, PRDOH regularly provides CDBG-DR written outreach materials for all municipalities to use and communicate to their constituents. These methods may include, but are not limited to:

- Print media, such as the newspaper;
- Social media;
- Radio or television advertisements;
- Letters or emails to municipalities, government agencies, non-profit organizations and NGOs;
- Notices posted to internet sites, including PRDOH's CDBG-DR and CDBG-MIT websites;
- Ads on billboards and bus stops;
- "Tumba coco" (a popular local method for communication which includes a vehicle with speakers used for promotion);
- Brochures and printed materials;
- Direct mail;

- Outbound call campaigns (live or automated);
- Email announcements;
- Community events or fairs;
- Webinars or web conferences;
- Web-based surveys;
- Focus groups or interviews;
- Community meetings;
- Press releases;
- Media events or interviews; and
- Other forms of communication accepted by HUD.

PRDOH will continue to coordinate outreach meetings with municipalities, government agencies, non-profit and community organizations, and other interested stakeholders to disseminate information related to the PRDOH Action Plan or substantial Action Plan amendments.

To promote access to information among LMI citizens, PRDOH will organize special orientation events throughout the Island or use broad-band media campaigns, once the launch of the first CDBG-DR fund program is completed, and dissemination initiatives begin. The use of direct communication with municipalities, government agencies, non-profit organizations and NGOs as partners is intended to increase residents' access to information and is supplemental to communication between PRDOH and residents. In addition to citizen involvement, PRDOH encourages the participation of regional and Island-wide institutions.

Simultaneously with the abovementioned efforts, PRDOH will distribute informational material through its regional offices and public residential administrators and strengthen the distribution of news information on the programs through regional media that operate in areas where CDBG-DR funds will intervene. This is in accordance with the Plan's initiatives aimed to strengthen access to information among LMI citizens and members of minority or disabled groups.

Citizen Complaints

As part of addressing Puerto Rico's long-term recovery needs, citizen complaints on any issues related to the general administration of CDBG-DR funds are welcome throughout the duration of the grant. PRDOH aims to provide an opportunity to address all complaints received. Addressing these complaints is an essential responsibility for PRDOH, as it establishes the importance of open communication regarding citizens' concerns about the programs.

It is PRDOH's responsibility, as grantee, to ensure that all complaints are dealt with promptly and consistently and at a minimum, to provide a timely, substantive written response to every **written** complaint within **fifteen (15) business days**, where practicable, as a CDBG grant recipient. See 24 C.F.R. § 570.486(a) (7).

PRDOH aims to provide an opportunity to address all complaints received, either formally or informally. An informal complaint refers to those complaints that are verbally communicated through PRDOH program personnel. These are not subject to 24 C.F.R. § 570.486(a) (7) unless the complainant requests for it to be filed as a formal complaint. A formal complaint is a written statement of grievance. All formal complaints will be documented, processed, filed, and answered. Complaints with insufficient data or submitted by a third party with no standing in the matter being submitted need not be accepted or reviewed.

Citizens who wish to submit formal complaints related to the CDBG-DR funded activities may do so through any of the following means:

- Via email at: LegalCDBG@vivienda.pr.gov
- Online at: https://cdbg-dr.pr.gov/en/complaints/ (English)
  https://cdbg-dr.pr.gov/quejas/ (Spanish)
- In writing at: Puerto Rico CDBG-DR Program/CDBG-MIT Program
  Attn: CDBG-DR/MIT Legal Division- Complaints
  P.O. Box 21365
  San Juan, PR 00928-1365

Although formal complaints are required to be submitted in writing, complaints may also be received verbally and by other means necessary, as applicable, when PRDOH determines that the citizen's particular circumstances do not allow the complainant to submit a written complaint. However, in these instances, PRDOH shall convert these complaints into written form. These alternate methods include, but are not limited to:

- Via telephone: 1-833-234-CDBG or 1-833-234-2324 (TTY: 787-522-5950)
  Attention hours: Monday to Friday from 8:00am-5:00pm
- In-person at: PRDOH Headquarters Office or Program Intake Centers

The Citizen Complaints Policy and all CDBG-DR and CDBG-MIT Program policies are posted in both English and Spanish languages at https://www.cdbg-dr.pr.gov/en/resources/policies/general-policies/ and https://www.cdbg-dr.pr.gov/recursos/politicas/politicas-generales/. All policies that pertain to the CDBG-DR program carry over to CDBG-MIT unless otherwise clarified in the document.

Citizen Complaints for Anti-Fraud, Waste, Abuse or Mismanagement

PRDOH, as grantee, is committed to the responsible management of CDBG-DR and CDBG-MIT funds by being a good advocate of the resources while maintaining a comprehensive policy for preventing, detecting, reporting, and rectifying fraud, waste, abuse, or mismanagement.

Pursuant to 87 FR 6364 ~~83 FR 40314 for CDBG-DR and Special Conditions in 85 FR 4676[67] for CDBG-MIT~~, PRDOH implements adequate measures to detect and prevent fraud, waste, abuse, or mismanagement in all Programs administered with CDBG-DR ~~or CDBG-MIT~~ funds. It also encourages any individual who is aware, or suspects, any kind of conduct or activity that may be considered an act of fraud, waste, abuse, or mismanagement, regarding the CDBG-DR ~~or CDBG-MIT~~ Program, to report such acts to the CDBG-DR Internal Audit Office, directly to the Office of Inspector General (OIG) at HUD, or any local or federal law enforcement agency.

The Anti-Fraud, Waste, Abuse, or Mismanagement Policy (**AFWAM Policy**) is established to prevent, detect, and report any acts, known or suspected, of fraud, waste, abuse, or mismanagement of CDBG-DR ~~and CDBG-MIT~~ funds. This Policy applies to any allegations or irregularities, either known or suspected, that could be considered acts of fraud, waste, abuse, or mismanagement, involving any citizen, previous, current or potential applicant, beneficiary, consultant, contractor, employee, partner, provider, subrecipient, supplier, and/or vendor under the CDBG-DR ~~and CDBG-MIT~~ Programs.

REPORT FRAUD, WASTE, ABUSE, OR MISMANAGEMENT TO PRDOH	
CDBG-DR Hotline	787-274-2135 (English/Spanish/TTY)
Postal Mail	Puerto Rico Department of Housing CDBG-DR Internal Audit Office P.O. BOX 21355 San Juan, PR 00928-1355
Email	hotlineCDBG@vivienda.pr.gov
Internet	https://cdbg-dr.pr.gov/app/cdbgdrpublic/Fraud https://cdbg-dr.pr.gov/app/cdbgdrpublic/Fraud
In person	Request a meeting with the Deputy Audit Director of the CDBG-DR Internal Audit Office located at PRDOH's Headquarters at 606 Barbosa Avenue, Building Juan C. Cordero Dávila, Río Piedras, PR 00918.

REPORT FRAUD, WASTE, ABUSE, OR MISMANAGEMENT DIRECTLY TO HUD OIG

~~[67] As amended by the letter *Grant Conditions in Federal Register Notice, "Allocations, Common Application, Waivers, and Alternative Requirements for Community Development Block Grant Mitigation Grantees; Commonwealth of Puerto Rico Allocation," issued on January 27, 2020 (85 FR 4676)* sent by HUD on March 26, 2021.~~

HUD OIG Hotline	1-800-347-3735 (Toll-Free) 787-766-5868 (Spanish)
Postal Mail	HUD Office of Inspector General (OIG) Hotline 451 7th Street SW Washington, D.C. 20410
Email	HOTLINE@hudoig.gov
Internet	https://www.hudoig.gov/hotline

The AFWAM Policy and all CDBG-DR Program policies are posted in English and Spanish at https://www.cdbg-dr.pr.gov/en/resources/policies/general-policies/ and https://www.cdbg-dr.pr.gov/recursos/politicas/politicas-generales/.

CERTIFICATIONS

CERTIFICATIONS

The Puerto Rico Department of Housing acknowledges HUD guidance as outlined in the February 3, 2022, ~~9, 2018~~ notice at 87 FR 6364 ~~83 FR 5844, 5867, 5868~~, to make the following certifications with its action plan:

a) The Puerto Rico Department of Housing certifies that it has in effect and is following a residential anti-displacement and relocation assistance plan in connection with any activity assisted with funding under the CDBG program.
b) The Puerto Rico Department of Housing certifies its compliance with restrictions on lobbying required by 24 C.F.R. Part 87, together with disclosure forms, if required by Part 87.
c) The Puerto Rico Department of Housing certifies that the Action Plan for Disaster Recovery is authorized under State and local law (as applicable) and that the grantee, and any entity or entities designated by the grantee, and any contractor, subrecipient, or designated public agency carrying out an activity with CDBG-DR funds, possess(es) the legal authority to carry out the program for which it is seeking funding, in accordance with applicable HUD regulations ~~and~~ as modified by waivers and alternative requirements. ~~this Notice.~~
d) ~~The grantee~~ The Puerto Rico Department of Housing certifies that activities to be administered with funds under this Notice are consistent with its Action Plan.
e) The Puerto Rico Department of Housing certifies that it will comply with the acquisition and relocation requirements of the URA, as amended, and implementing regulations at 49 C.F.R. Part 24, except where waivers or alternative requirements are provided for in this Notice.
f) The Puerto Rico Department of Housing certifies that it will comply with section 3 of the Housing and Urban Development Act of 1968 (12 U.S.C. §1701u) and implementing regulations at 24 C.F.R. Part 75.
g) The Puerto Rico Department of Housing certifies that it is following a detailed citizen participation plan that satisfies the requirements of 24 C.F.R. §91.105 or §91.115, as applicable (except as provided for in notices providing waivers and alternative requirements for this grant). Also, each local government receiving assistance from a State grantee must follow a detailed citizen participation plan that satisfies the requirements of 24 C.F.R. §570.486 (except as provided for in notices providing waivers and alternative requirements for this grant).
h) The Puerto Rico Department of Housing certifies, as a State receiving a direct award under this Notice, that it has consulted with affected local governments in counties designated in covered major disaster declarations in the non-entitlement, entitlement, and tribal areas of the State in determining the uses of funds, including method of distribution of funding, or activities carried out directly by the State.
i) The Puerto Rico Department of Housing certifies that it is complying with each of the following criteria:

(1) Funds will be used solely for necessary expenses related to disaster relief, long-term recovery, restoration of infrastructure and housing, and economic revitalization in the most impacted and distressed areas for which the President declared a major disaster in 2018 and 2019 pursuant to the Robert T. Stafford Disaster Relief and emergency Assistance Act of 1974 (42 U.S.C. §5121 *et seq.*).

(2) With respect to activities expected to be assisted with CDBG-DR funds, the Action Plan has been developed to give the maximum feasible priority to activities that will benefit low- and moderate-income families.

(3) The aggregate use of CDBG-DR funds shall principally benefit low- and moderate-income families in a manner that ensures that at least 70 percent of the grant amount is expended for activities that benefit such persons.

(4) The Puerto Rico Department of Housing will not attempt to recover any capital costs of public improvements assisted with CDBG-DR grant funds, by assessing any amount against properties owned and occupied by persons of low- and moderate-income, including any fee charged or assessment made as a condition of obtaining access to such public improvements, unless: (a) disaster recovery grant funds are used to pay the proportion of such fee or assessment that relates to the capital costs of such public improvements that are financed from revenue sources other than under this title; or (b) for purposes of assessing any amount against properties owned and occupied by persons of moderate income, the Puerto Rico Department of Housing certifies to the Secretary that it lacks sufficient CDBG funds (in any form) to comply with the requirements of clause (a).

j) The Puerto Rico Department of Housing certifies that it ~~grant~~ will conduct and carry out the grant in conformity with title VI of the Civil Rights Act of 1964 (42 U.S.C. §2000d) and the Fair Housing Act (42 U.S.C. §§3601–3619) and implementing regulations, and that it will affirmatively further fair housing.

k) The Puerto Rico Department of Housing certifies that it has adopted and is enforcing the following policies. In addition, States receiving a direct award must certify that they will require UGLGs that receive grant funds to certify that they have adopted and are enforcing:

(1) A policy prohibiting the use of excessive force by law enforcement agencies within its jurisdiction against any individuals engaged in nonviolent civil rights demonstrations; and

(2) A policy of enforcing applicable State and local laws against physically barring entrance to or exit from a facility or location that is the subject of such nonviolent civil rights demonstrations within its jurisdiction.

l) The Puerto Rico Department of Housing certifies, as a State receiving a direct award under this Notice, ~~certifies~~ that it (and any subrecipient or administering entity) currently has or will develop and maintain the capacity to carry out disaster

recovery activities in a timely manner and that the grantee has reviewed the requirements of this notice.

m) The grantee certifies to the accuracy of its Financial Management and Grant Compliance certification ~~checklist~~ Requirements, or other recent certification submission, if approved by HUD, and related supporting documentation as provided in section III.A.1. of the Consolidated Notice and the grantee's implementation plan and related submissions to HUD as provided in section III.A.2. of the Consolidated Notice. ~~(Public Law 115-56) or Public Law 116-20 Financial Management and Grant Compliance certification checklist, or other recent certification submission, if approved by HUD, and related supporting documentation referenced at A.1.a under Section VI and its Implementation Plan and Capacity Assessment and related submission to HUD referenced at A.1.b under Section VI.~~

n) The Puerto Rico Department of Housing will not use grant funds for any activity in an area identified as flood prone for land use or hazard mitigation planning purposes by the State, local, or tribal government or delineated as a special flood hazard area (or 100-year floodplain) in FEMA's most recent flood advisory maps, unless it also ensures that the action is designed or modified to minimize harm to or within the floodplain, in accordance with Executive Order 11988 and 24 C.F.R. Part 55. The relevant data source for this provision is the State, local and tribal government land use regulations and hazard mitigation plan and the latest issued FEMA data or guidance, which includes advisory data (such as Advisory Base Flood Elevations) or preliminary and final Flood Insurance Rate Maps.

o) The Puerto Rico Department of Housing certifies that its activities concerning lead-based paint will comply with the requirements of 24 C.F.R. Part 35, subparts A, B, J, K, and R.

p) The Puerto Rico Department of Housing certifies that it will comply with environmental requirements at 24 C.F.R. Part 58.

q) The Puerto Rico Department of Housing certifies that it will comply with Title 1 of the HCDA and with other applicable laws.

Warning: Any person who knowingly makes a false claim or statement to HUD may be subject to civil or criminal penalties under 18 U.S. C. 287, 1001 and 31 U. S. C. 3729.

APPENDICES

Appendices to the Action Plan can be found on the PRDOH website at: www.cdbg-dr.pr.gov/en/action-plan/ in English; and at https://www.cdbg-dr.pr.gov/plan-de-accion/ in Spanish. Appendices include:

- Appendix A – [Reserved for public comments]
- Appendix A.1 – [Reserved for public comments]
- Appendix B – Outcome Projections
- Appendix C – Financial Projections and Actual Expenditures by Program
- Appendix D – CDBG-DR Program Income Limits in PR

DEPARTMENT OF
HOUSING

PUERTO RICO DISASTER RECOVERY ACTION PLAN

For the use of CDBG-DR Funds in response to 2019-2020 Earthquakes and 2020 Tropical Storm Isaias (DR- 4473-PR) and (DR-4560-PR)