NORTHERN MARIANAS HOUSING CORPORATION

Community Development Block Grant – Disaster Recovery (CDBG-DR) Division

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June 7, 2023

Michelle P. Cushing
CPD Specialist, ODR
U.S. Department of Housing and Urban Development
1003 Bishop Street Suite #2100
Honolulu, HI 96813

RE: Non-Substantial Amendment No. 01 (CDBG-MIT Action Plan)

Dear Ms. Cushing:

Hafa Adai and Tirow! I hope this letter finds you well and in good spirits.

Pursuant to **Subsection 8.7.2. (ii)**[1], of the Northern Marianas Housing Corporation's (NMHC) Community Development Block Grant – Mitigation (CDBG-MIT) Action Plan, as amended, this is to respectfully notify the U.S. Department of Housing and Urban Development (HUD) that NMHC is hereby modifying its CDBG-MIT Action Plan, by way of this non-substantial amendment, which seeks to reduce allocation set aside for Planning activities, de-obligate the sum of $94,500, and reprogram the amount $94,500 de-obligated from Planning to the CDBG-MIT Infrastructure Mitigation Program and Activities.

Non-Substantial Amendment No. 01

Summary

The following proposed modifications shall go into effect five (5) days following formal notification to HUD as prescribed by NMHC's CDBG-MIT Action Plan.

The proposed modifications, as presented herein, were prompted by the following reason(s):

[1] ***Non-substantial amendments*** require notice to HUD at least 5 days prior to the amendment going into effect. They do not require notice to the Public on the changes of $5 million or less. All amendments will be listed on the CDBG-MIT website sequentially.

1. The "Implementing Partner," Commonwealth Utilities Corporation (CUC), updated its Independent Cost Estimates (ICE) for the Dandan, Saipan and Tinian Carolinas Water Tank Replacement Projects which yielded a funding shortfall in the amount of $94,500;
2. CUC has reported to NMHC that the A&E plans for the above-mentioned projects are near completion and to avoid de-scoping or delay the mitigation projects, the Implementing Partner appealed to NMHC for assistance in funding both projects that show a $94,500 shortfall.

See Table below that shows previous and updated ICE:

Project Name	**Previous Estimated Costs**	**Current Estimated Costs**
Dandan Water Tank Replacement	$7,048,000.00	$8,622,000.00
Tinian Carolinas Heights Water Tank Replacement	$5,180,000.00	$6,075,000.00
TOTAL	$12,228,000.00	$14,697,000.00
VARIANCE/DIFFERENCE	$2,469,000.00	
CDBG-MIT ALLOCATION	$14,602,500.00	
FUNDING SHORTFALL	$94,500.00	

The proposed changes, authorized by this Non-Substantial Amendment are as follows:

Changes (highlighted)

VERSION HISTORY (Page ii)

Version	**Published by NMHC**	**Approved by HUD or Effective Date of Non-Substantial Amendment**
Draft Initial Action Plan	02/11/2022	TBD
Approved Action Plan	04/04/2022	06/03/2022
2.0 Non-Substantial Amendment No. 01	06/07/2023	06/13/2023

TABLE 2: PROGRAMMATIC ALLOCATION OF CNMI's CDBG-MIT FUNDING (Page 3)

1: Programmatic Allocation of CNMI's CDBG-MIT Funding

Program	**Allocation**	**Percentage**
Infrastructure Mitigation Program and Activities	$14,697,000	91%
Administration	$811,250	5%
Planning	$716,750	4%
Total:	$16,225,000	100%

TABLE 69: CDBG-MIT BUDGET SUMMARY (Page 102)

Use of Funds	Budget	Expenditure Schedule					
		2022	2023	2024	2025	2026	2027
Infrastructure	$14,697,000	$1,460,250	$5,142,375	$5,142,375	$2,952,000	-	-
Planning Activities	$716,750	$81,125	$252,438	$252,438	$130,750	-	-
Administration	$811,250	$81,125	$283,938	283,938	$162,250	-	-
Total	$16,225,500	$1,622,500	$5,678,750	$5,678,750	$3,245,000	-	-

Thank you and please feel free to contact me should you have any questions or require additional information.

Sincerely,

JESSE S. PALACIOS
Corporate Director

cc : NMHC Board of Directors
: Deputy Corporate Director
: Chief Financial Officer
: CDBG-DR Program Manager
: CDBG-DR Projects Manager
: File

Attachment: Revised CDBG-MIT Action Plan containing Non-Substantial Amendment No. 01

COMMONWEALTH OF THE NORTHERN MARIANA ISLANDS

Community Development Block Grant Mitigation (CDBG-MIT) Program

CDBG-MIT Action Plan

PUBLIC COMMENT PERIOD:
February 11, 2022 – April 2, 2022

RELEASED BY THE NORTHERN MARIANAS HOUSING CORPORATION: February 11, 2022

APPROVED BY THE U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT: 06/03/2023

PURPOSE

The Commonwealth of the Northern Mariana Islands (CNMI) qualified for receipt of Community Development Block Grant-Mitigation (CDBG-MIT) funds through the U.S. Department of Housing and Urban Development (HUD) and has prepared this CDBG-MIT Action Plan to fulfill the requirements of Federal Register Notice 86 FR 561 to receive these funds.

The Action Plan is proposed as an implementation mechanism for the CNMI's Standard State Mitigation Plan (SSMP), which was adopted in 2018. Various references within this Action Plan, such as those concerning the CNMI's profile, risk assessment/ranking, needs assessment, and mitigation actions originate from the SSMP.

Information concerning the CDBG-MIT Program and Action Plan can be found at: https://www.cnmi-cdbgdr.com/CDBG-MIT/

PUBLIC MEETINGS

CDBG-MIT Initial Action Plan Pre-Release Public Meeting (Virtual)
February 9, 2022
9:00 a.m. – 10:00 a.m.

CDBG-MIT Initial Action Plan Post-Release Public Meeting (Virtual)
February 16, 2022
9:00 a.m. – 10:00 a.m.

CONTACT INFORMATION

The Northern Marianas Housing Corporation (NMHC) is the responsible entity for the CDBG-MIT program. Contact information for NMHC is as follows:

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CDBG-MIT
P.O. Box 500514
Saipan, MP 96950
Tel. Nos. (670) 234-6866|9447|7670 Saipan
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Website: https://www.cnmi-cdbgdr.com/CDBG-MIT/

VERSION HISTORY

Version history is tracked in the following table, with notes regarding version changes. The dates of each publication are also tracked in the table. The first version of this document is 1.0.

Substantial Amendments. The following constitute a substantial amendment to this Action Plan:

- The addition of a CDBG-MIT covered project
- A change in program benefit or eligibility criteria
- The addition or deletion of an activity
- The allocation or reallocation of more than 10% of the total grant amount

Substantial Amendments will result in the issuance of a new version number.

Non-Substantial Amendments. Lesser modifications than those identified above, including minor wording/editing/clarification, constitute non-substantial amendments. These amendments will be denoted by a sequential number increase after the primary version number.

The above-described numbering convention would result in a new version number such as 1.1 (Non-Substantial Amendment), 2.0 (Substantial Amendment), 2.1 (Non-Substantial Amendment), etc.

Version	**Published by NMHC**	**Approved by HUD or Effective Date of Non-Substantial Amendment**
Draft Initial Action Plan	02/11/2022	N/A
Approved Action Plan	04/04/2022	06/03/2023
2.0 Non-Substantial Amendment No. 01	06/07/2023	06/13/2023

Substantial Amendment Process

A Substantial Amendment to the Action Plan will follow the same procedures for publication as the original Action Plan in accordance with NMHC's Citizen Participation Plan (CPP). All Amendments (Substantial and Non-Substantial) will be numbered sequentially and posted on the NMHC CDBG-MIT website. The beginning of every amendment will include a section that identifies the content that is being added, deleted, or changed. The CNMI's most recent version of the entire Action Plan will be accessible for viewing as a single document at any given time.

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Table of Figures

1.0 INTRODUCTION

The Commonwealth of the Northern Mariana Islands (CNMI) is an archipelago in the Western North Pacific Ocean consisting of 14 islands, and spanning over three hundred miles. The majority of residents live on Tinian, Rota, and Saipan, which are home to varying concentrations of infrastructure, economic assets, socio-cultural features, and natural resources. Given the CNMI's position in "Typhoon Alley", communities throughout the Northern Mariana Islands are highly exposed to a variety of storm and flood-related threats. The combination of high frequency and intensity of hazards and the CNMI's isolated location translates into particularly devastating effects following the immediate impact of hazard events, especially in densely populated areas like Garapan on the capitol island of Saipan. Major typhoons have recently devastated the islands, including Super Typhoons Soudelor in 2015 and Yutu in 2018, as well as other significant typhoons that included Mangkhut in 2018 and Hagibis in 2019. The cumulative impact of these events, along with more frequent, less intense hazards, underscores the need for updated mitigation planning and forward-thinking projects that will reduce future damage.

This mitigation action plan is specific to activities authorized through the U.S. Department of Housing and Urban Development (HUD) as part of supplemental Community Development Block Grant – Mitigation (CDBG-MIT) program funding, and provides an overview of the programmatic aspects of relevant appropriations (Section 1). The brief overview is followed by a detailed profile of individual hazards and analysis of hazard-specific risks (Section 2), and collates the results of analyses into a mitigation prioritization scheme and spatially-explicit needs assessment (Section 3). These components of the plan were then used to conduct consultations with appropriate mitigation and infrastructure authorities in the CNMI (Section 5) to determine the most relevant categories of hazard mitigation actions and generate an associated project list, with an emphasis on infrastructure resilience (Section 6). In the process of developing and vetting the plan, several key resources related to new mitigation actions, including nature-based infrastructure, and guidance on more resilient growth were used to ensure projects are directly aligned with CNMI-specific mitigation goals. Specifically, recent guidance on "Smart, Safe, Growth" in the Commonwealth (Nimbus Environmental, FEMA, U.S. EPA 2018) and associated project screening criteria were referenced to ensure mitigation actions are relevant to local growth and development trajectories.

1.1 Appropriations Act and Funding Authority

In response to the catastrophic damage, significant economic loss, and consequent unmet financial needs caused by Super Typhoon Yutu and Typhoon Mangkhut, the United States Congress appropriated HUD CDBG – Disaster Recovery (CDBG-DR) funding to the Commonwealth of the Northern Marianas Islands. The sum of $186 million in CDBG-MIT funds was also allocated to grantees recovering from qualifying 2018 disasters and through *Additional Supplemental Appropriations for Disaster Relief Act of 2019*. The CDBG-MIT program was created through HUD and made available to communities administering CDBG-DR funding to help them prepare for future disasters. Funding and allocations referenced in this plan will therefore compliment other disaster recovery projects, while adding a mitigation-focused dimension to the CNMI's ongoing recovery and path to community resilience.

1.1.1 CDBG-DR Funding

HUD, through CDBG-DR funding, initially allocated financial assistance to grantees recovering from qualifying 2018 disasters. The CDBG-DR funding is intended to specifically address unmet disaster

recovery needs concerning restoration of housing, infrastructure, and economic revitalization in the "most impacted and distressed" (MID) areas. The CNMI must address its unmet housing recovery needs primarily with these funds. The entire CNMI has been determined to be the most impacted and distressed area for use of CDBG-DR funding arising from the two 2018 disasters; Super Typhoon Yutu and Typhoon Mangkhut, respectively. The CNMI is investing its CDBG-DR funding in the area physically impacted by the qualifying disasters of Super Typhoon Yutu and Typhoon Mangkhut in 2018. The use of the $254,324,000 CNMI's CDBG-DR allocation is described in a separate Action Plan which is accessible at https://www.cnmi-cdbgdr.com/action-plan/action-plan-documents/.

1.1.2 CDBG-MIT Funding

HUD published its Federal Register Notice 86 FR 561 on January 6, 2021, with an effective date of January 11, 2021, for allocation of over $186 million in CDBG-MIT funds to grantees recovering from qualifying 2018 disasters. Funds allocated by this notice were made available by the *Additional Supplemental Appropriations for Disaster Relief Act of 2019*. Super Typhoon Yutu and Typhoon Mangkhut, which ravaged the CNMI (DR-4404 and DR-4396), were qualifying events for the Commonwealth, with over $16,000,000 in CDBG-MIT funds being allocated through 86 FR 561.

Per 84 FR 45838, HUD differentiates between the purpose of CDBG-MIT funds and CDBG-DR funds, in that CDBG-MIT funds are to be used for mitigation 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". CDBG-MIT allocations to CNMI for these mitigation-specific goals are listed in Figure 1-1.

1: Total Allocation for Mitigation Activities under U.S. Public Law

Disaster No.	Grantee	Total Allocation for CDBG-MIT for 2018 disasters under Public Law 116-20	Minimum amount that must be expended in the HUD-identified MID Areas	HUD-identified "most impacted and distressed" (MID) areas
4396 and 4404	Commonwealth of the Northern Mariana Islands	$16,225,000	$8,112,500	Saipan and Tinian Municipalities

1.1.3 HUD Eligible Activities

HUD identified eligible activities that CDBG-MIT funds may be used for, including:

a. Support infrastructure projects, housing activities, public services, economic development, disaster preparedness, and planning efforts that relate to eligible hazard mitigation activities;
b. Increase resilience and reduce or eliminate risks, per HUD's definition of mitigation; and
c. Used as a flexible funding match.

Similar to CDBG-DR funding, MIT funds may be used as a match, and may allow up to 5% of the total funding for administrative programs and 15% for planning activities. Funds cannot be used for direct beneficiary reimbursement or assistance to private utilities unless HUD grants a waiver. A

programmatic breakdown of the funding is provided in Figure 1-2. Note that Planning programs have 5% of the overall CDBG-MIT funding, less than the 15% maximum, so that more funding can be available for significant infrastructure mitigation actions.

NON-SUBSTANTIAL AMENDMENT NO. 01

Summary and Modifications

Pursuant to **subsection 8.7.2 (ii)**, the following proposed modifications shall go into effect five (5) days following formal notification to HUD or on June 13, 2023 as prescribed by NMHC's CDBG-MIT Action Plan.

The proposed modifications, as presented herein, were prompted by the following reason(s):

1. The "Implementing Partner," the Commonwealth Utilities Corporation (CUC), has updated its Independent Cost Estimates (ICE) for the Dandan, Saipan and Carolinas Heights, Tinian Water Tank Replacement projects which effectively yielded a funding shortfall in the amount of $94,500;

2. CUC has reported to NMHC that the A&E plans for the above-stated projects are near completion and to avoid de-scoping and delay of these mitigation projects, the Implementing Partner has appealed to NMHC for assistance in covering the $94,500 funding shortfall.

3. The Non-Substantial Amendment is required to authorize the reprogramming of the sum of $94,500 from Planning Activities to the Infrastructure Mitigation Program and Activities and needed to cover the project's funding shortfall.

See Table NSA 01 that shows previous and updated ICE covering these mitigation projects:

Table NSA 01

Project Name	**Previous Estimated Costs**	**Current Estimated Costs**
Dandan Water Tank Replacement	$7,048,000.00	$8,622,000.00
Tinian Carolinas Heights Water Tank Replacement	$5,180,000.00	$6,075,000.00
TOTAL	$12,228,000.00	$14,697,000.00
VARIANCE/DIFFERENCE	$2,469,000.00	
CDBG-MIT ALLOCATION	$14,602,500.00	
FUNDING SHORTFALL	$94,500.00	

2: Programmatic Allocation of CNMI's CDBG-MIT Funding

Program	**Allocation**	**Percentage**
Infrastructure Mitigation Program and Activities	$14,697,000	91%
Administration	$811,250	5%
Planning	$716,750	4%
Total:	$16,225,000	100%

1.2 Hazard Mitigation

Hazards and associated mitigation efforts have been defined in various ways and by numerous authorities in recent decades, ranging from relatively narrow sector or threat-specific definitions to broader descriptions of all phenomena that pose risks to humans and the environment. For the purposes of this action plan, FEMA's definition of "Hazard Mitigation" is adopted and includes "any action taken to increase resilience to disasters and reduce or eliminate risk to human life and property from man-made or natural hazards." Hazard mitigation comes in various forms, including short-term and long-term policies, programs, projects, and other activities that alleviate impacts from a hazard or disaster. These actions may look vastly different depending on what category of hazard is being addressed: natural, human-caused, and technological, and mitigation efforts may target a combination of these categories. Regardless of hazard category, FEMA defines an individual "hazard" as "any event or condition with the potential to cause fatalities, injuries, property damage, infrastructure damage, agricultural loss, environmental damage, business interruption, or other structural or financial loss".

While the projects and actions proposed in this plan may reduce impacts from multiple types of hazards, the risk analyses and consultations regarding mitigation needs are heavily focused on natural disasters (e.g. tropical cyclones) and chronic hazards that may result from a combination of natural and human-influenced phenomena (e.g. inland flash flooding of low-lying areas with large impervious surfaces). The emphasis on these types of hazards is reflective of both CNMI's recent history of hazard impacts (e.g. typhoons) and subsequent guidance on growth, as well as the phenomena that triggered the underlying mitigation funding appropriations to CNMI.

1.3 CDBG-MIT Action Plan Development and Purpose

The CNMI, through the Northern Marianas Housing Corporation (NMHC), has developed this Action Plan, as required by HUD, in order to access the CDBG-MIT funds for use on strategic hazard mitigation activities. The activities described in this plan are informed by, and compatible with the strategies embedded in the CNMI's Standard State Mitigation Plan (SSMP), which was most recently updated and adopted in 2018 as the primary resource for guiding local long-term planning and hazard risk reduction efforts.

1.3.1 Action Plan Elements

Federal guidance on MIT Action Plan development, identifies the following elements for consideration:

a. Mitigation Needs Assessment
b. Long-Term Planning and Risk Mitigation Considerations
c. Connection of Mitigation Programs and Projects to Risks
d. Low-Moderate Income (LMI) and Urgent Need Priorities
e. Coordination of Projects and Leverage
f. Maximum Award Amounts
g. Plans to Minimize Displacement and Ensure Accessibility
h. Natural Infrastructure
i. Construction Standards
j. Operation and Maintenance
k. Cost Verification
l. Building Code and Hazard Mitigation Planning

1.3.2 HUD CDBG-MIT Goals

HUD's CDBG-MIT program goals, which provide guidance to the CNMI in its program delivery, include:

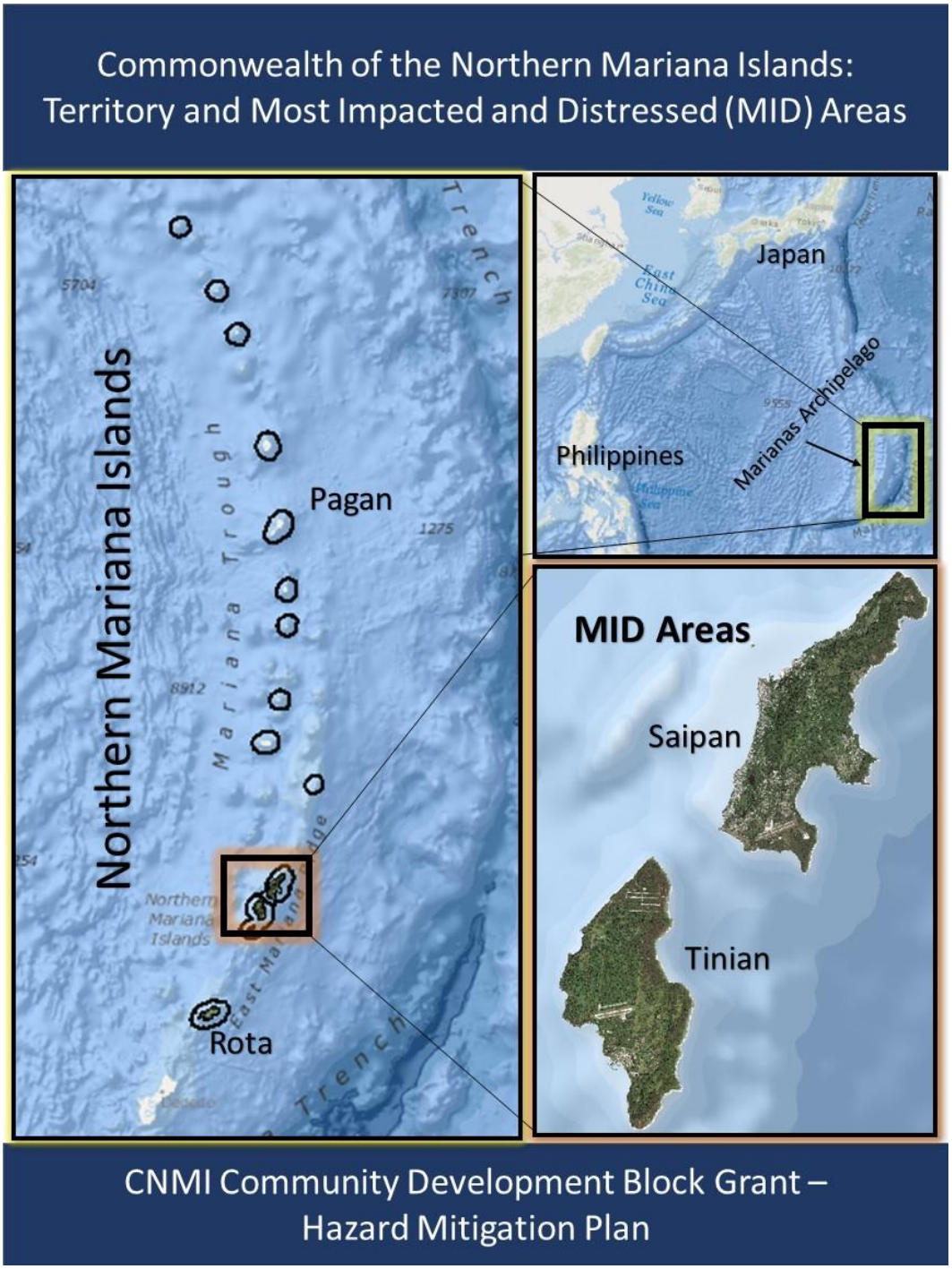
a. Support data-informed investments, focusing on repetitive loss of property and critical infrastructure
b. Build capacity to comprehensively analyze disaster risks and update hazard mitigation plans
c. Support the adoption of policies that reflect local and regional priorities that will have long-lasting effects on community risk reduction, including risk reduction to the community lifelines and decreasing future disaster costs
d. Maximize the impact of funds by encouraging leverage, private/public partnerships, and coordination with other federal dollars.

In addition to these programmatic goals, CDBG-MIT funded-projects will also seek to target mitigation investments in geographic areas and populations that have experienced the most impacts from hazards.

1.3.3 Most Impacted and Distressed (MID) Area

The Municipalities of Saipan and Tinian have been identified as the Most Impacted and Distressed Areas. These islands experienced a direct passage from Super Typhoon Yutu in October 2018, absorbing the vast majority of the storm's impact. The islands are shown in the context of the broader CNMI, Marianas Archipelago, and Western Pacific in figure 3.

3: Map of CNMI and Most Impacted and Distressed Areas



2.0 HAZARD PROFILES AND RISK

Risk assessment is a process of measuring potential loss of life, personal injury, economic injury, property damage, and other negative community impacts resulting from natural hazards. In the immediate planning horizon this type of assessment allows emergency management personnel to establish response priorities by identifying potential hazards and vulnerable assets and communities. At a broader scale, the risk assessment enables data-driven hazard mitigation planning and strategy development. The basic risk assessment process focuses on the following key elements:

- Hazard identification: Utilization of all available information to determine the types of disasters that may affect a jurisdiction, how often they can occur, and their potential severity.
- Vulnerability identification: Determine the impact of natural hazard events on the people, property, environment, and economy of a locale.
- Cost evaluation: To the degree possible given best available data, estimate the cost of potential damage and/or cost that can be avoided by mitigation.

In the development of the CNMI's 2018 Standard State Mitigation Plan (SSMP), which informs and guides significant components of this CDBG-MIT Action Plan, a thorough hazard risk and needs assessment was performed with the best available data at the time. Moreover, the CNMI has used the most recent risk assessment completed through the FEMA Hazard Mitigation Program process to inform the hazards analyzed in this action plan, and to guide the subsequent use of CDBG-MIT funds (84 FR 45840 and 86 FR 561).

It is important to note that substantial updates to national and state level data regarding hazards, built environment, and socio-economic characteristics have enabled many locales to assess risk in a more comprehensive, standardized manner during the mitigation planning process. The recent publication of the National Risk Index (Zuzak et. al 2021) and mapping tool from FEMA provides a well-structured, consistent and transparent method for many states to determine risk. The risk index is comprised of (1) a natural hazards component with calculated losses from hazard events, (2) a "consequence enhancing" component consisting primarily of a census-informed social vulnerability index, and (3) a "consequence reduction" component that estimates "community resilience" as the ability of a community to prepare for and adapt to hazards.

CNMI was not included in the National Risk Index in its initial 2021 public release; however, efforts were taken in the CDBG-MIT planning process to quantify and develop proxies for Index components, particularly with respect to natural hazard exposure and losses, as well as social vulnerability. The analysis and resulting area-based mitigation prioritization index for CNMI is described in detail in Section 3 of this plan, while the initial natural hazard profiles and data that informed the risk assessment are highlighted here in sub-section 2.1.

In the process of developing the following hazard profiles and the subsequent risk assessment and mitigation prioritization areas, the following resources were utilized as appropriate:

- FEMA (Federal Emergency Management Agency) Local Mitigation Planning Handbook
- FEMA Hazus GIS-based software and associated Hazus database for CNMI assets, buildings, populations, and facilities.

- CNMI Coastal Resilience Assessment (Dobson et. al 2020) and Coastal Resilience Evaluation and Siting Tool (CREST)
- FEMA Special Wind Region data for the Commonwealth of the Northern Mariana Islands (2020)
- International Code Council – International Building Code and Residential Code (2018)
- NOAA Office for Coastal Management - Coastal Flood Exposure Mapper (coast.noaa.gov/floodexposure/)
- NOAA Pacific Marine Environmental Laboratory - Tsunami Hazard Assessment of the CNMI (Uslu et. al 2013)
- Tabular and spatial data for CNMI-wide infrastructure and buildings (CNMI Department of Public Works; Commonwealth Utilities Corporation)
- National Centers for Environmental Information - International Best Track Archive for Climate Stewardship (IBTrACS – Knapp et. al 2021)
- Miscellaneous assessment data gathered from other Federal and Local agencies (e.g. CNMI Climate Vulnerability Assessments; U.S. Army Corps Post-Disaster Watershed Assessment for CNMI; FEMA Risk MAP preliminary reports for CNMI)

2.1 CNMI Profile

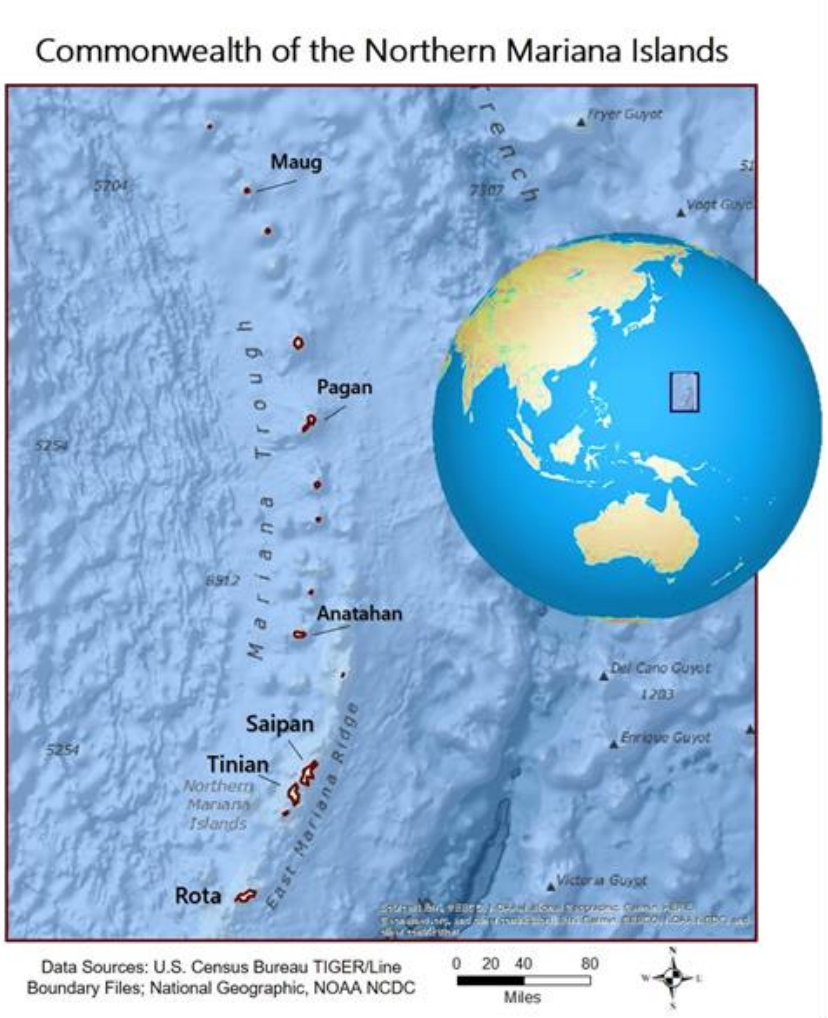
2.1.1 Geographic Overview

The Mariana Archipelago, including CNMI, developed west of the Mariana Trench along the edge of the Philippine Plate. The volcanic island arc comprises a total of fifteen islands and is politically separated into the U.S. Territories of Guam and CNMI. The fourteen islands that comprise the CNMI extend approximately 400 nm from Rota (14° Latitude) north to Uracas (20° Latitude).

Although the islands are volcanic in nature, the populated southern islands of the CNMI (Saipan, Tinian, Rota) are capped with a unique karst and limestone geology that creates highly permeable cover and steep, terraced topography. These natural features offer both opportunities and constraints for flood-related hazard mitigation.

The largest island, Saipan, is 45.89 square miles in size, and serves as the Commonwealth's government seat and population center. The Northern Islands of Pagan, Asuncion, and Alamagan also support small subsistence-based communities, with semi-permanent populations ranging from 5-15 (Liske-Clark 2015). These populations have only been formally documented via the U.S. Census Bureau since the 2020 decennial population counts, which place the Northern Islands population at 7.

4: Map of CNMI Location in the Western Pacific



Climate and Storm Hazard Context

The CNMI's climate is representative of small Western Pacific islands within the range of the inter-tropical convergence zone, where northeast trade winds converge with equatorial low pressure, and seasonal variation in rainfall, temperature, storm activity, and dominant winds result from a north-south migration of that low pressure trough. There is little seasonal temperature variation; average daily temperatures hover around 83°F with less than 3.5°F of seasonal variation (Lander 2004). Humidity is stable throughout the year, ranging between 80-90%.

Annual and inter-annual precipitation is characterized by greater variability, with discrete dry (January through May) and wet (July through November) seasons produced by the annual movement of a regional low-pressure trough and associated monsoon activity. The months of May-June and November-December constitute transition months between these two modes (Lander 2004). During the wet season Saipan receives two thirds of its annual 80 inches of rainfall, predominantly from tropical cyclones or convective cloud clusters. The wet season is characterized by calmer winds, while the dry season is characterized by consistent trade winds and frequent light to moderate showers. On Saipan, where the majority of CNMI's population

and human uses are concentrated, spatial variation in rainfall has also been documented, with the highest levels of precipitation occurring around the high-elevation center of the island, and smaller annual averages around the southern and western villages (Lander 2004). This localized variation in rainfall has implications for inland flooding hazards.

CNMI's inter-annual and annual rainfall is heavily influenced by large-scale meteorological phenomena that occur on multi-year and decadal time frames, particularly the El Niño Southern Oscillation (ENSO). The cooler waters created by ENSO positive conditions (El Niño) in the Western Pacific bring drought conditions to the Marianas in the latter half of El Niño years, which generally occur every four to seven years. CNMI's driest years on record are all associated with the tail-end of large ENSO positive events. Wetter, windier years associated with La Niña tend to follow a strong El Niño (Lander 2004). Of particular importance is the CNMI's central location in the most prolific tropical cyclone basin on the planet, which introduces immense local variation in meteorological records due to data spikes from extreme downpours. Direct passage of a typhoon over Saipan, Tinian, or Rota might significantly raise the annual precipitation record for that single location while having far less impact on precipitation records for islands to the north (e.g. Pagan) or south (e.g. Guam).

Sea levels in the CNMI are also closely tied to ENSO conditions across the Pacific. Lower sea levels are documented during El Niño episodes due to reduced trade winds in the central and western Pacific basins, while higher sea levels occur during La Niña's enhanced trade wind regime, which tends to force seas from the Eastern Pacific into the Western Pacific and Marianas.

Sea level change and variability is highlighted here due to the implications it poses for enhanced coastal flooding during periods of higher sea levels. The latter threat is particularly significant to Saipan's western coastal plain, which is susceptible to coastal erosion, sea level rise, and storm activity. Changes in sea level associated with a transition from El Niño to La Niña conditions (0.3-0.6 m, or 1-2 ft) may simulate decades of anticipated sea level rise due to climate change.

This variability is important to consider when assessing potential impacts from storms. Coastal flooding from tropical cyclones has had major impacts on Saipan and Rota over the last several decades, with a maximum coastal inundation due to wave run-up estimated at 20 feet in Songsong Village, Rota. These events, along with other hazards, are detailed in the following sections.

2.1.2 Major Past Disaster Events

Presidential disaster declarations are made for hazard events that cause more damage than the state and local governments can handle without federal government assistance, although no dollar loss threshold has been established for the declarations. These declarations initiate federal recovery programs to help disaster victims, businesses, and public entities. The CNMI has experienced five (5) events since 2002 (figure 5), for which presidential disaster declarations were issued. All five of these events were the result of a direct or near direct passage of typhoons.

Examination of these past events helps identify targets for risk reduction and ways to increase the community's capability to avoid large-scale events in the future. It is worth mentioning that many natural hazard events do not trigger federal disaster declarations but still have significant

local impacts. Such events are also important to consider in establishing recurrence intervals for hazards of concern.

5: Presidential Disaster Declarations for Hazard Events in the CNMI

Disaster Type/Name	Disaster Declaration No.	Date
Typhoon Kim		December 1986
Typhoon Lynn		October 1987
Typhoon Koryn		January 1990
Typhoon Paka		December 1997
Typhoon Chata'an	DR-1447	December 11, 2002
Flooding (Typhoon Chaba)	DR-1541	August 26, 2004
Typhoon Soudelor	DR-1611	November 8, 2015
Typhoon Mangkhut	DR-4396	September 29, 2018
Typhoon Yutu	DR-4404	October 26, 2018

2.1.3 Demographic Profile of Impacted Areas

According to the 2020 United States Census, 47,329 people were living in the CNMI. With a total landmass of 183.5 square miles, the vast majority of the population resides on the southernmost islands of Saipan, Tinian, and Rota. The other 11 islands that make up the Northern Mariana Islands are sparsely inhabited; therefore, they are not included in this allocation of CDBG-MIT funds. The following tables and figures derived from the 2020 U.S. Census provide baseline demographic information of the impacted areas. It should be noted that detailed demographic information beyond population and housing counts has not been released for the 2020 U.S. Census at the time this plan was developed, therefore additional analyses of socially vulnerable populations and other demographic variables rely on 2010 U.S. Census data:

6: Population Change in CNMI from 2010-2020

Population of the Commonwealth of the Northern Mariana Islands: 2010 and 2020

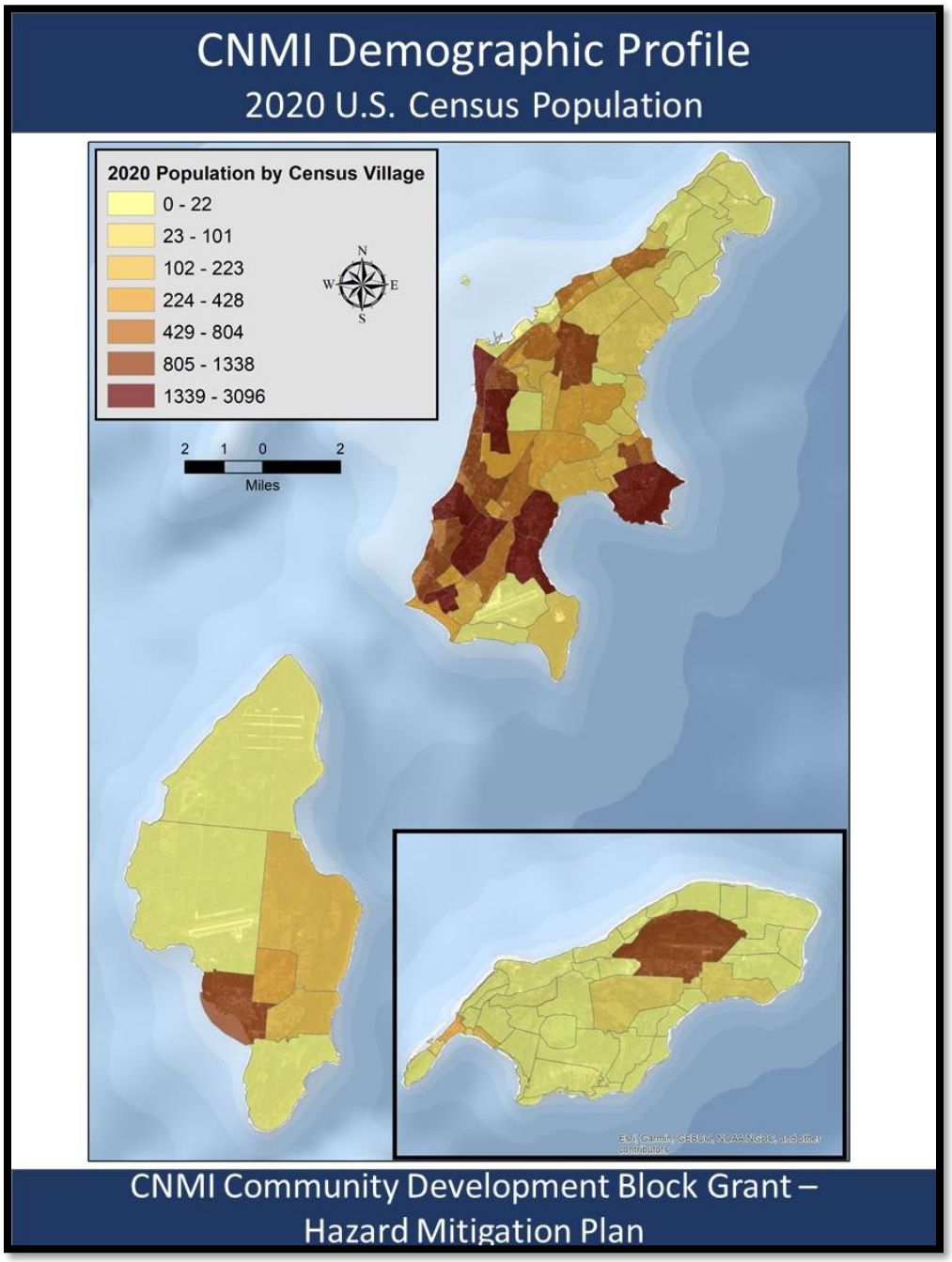
Geographic area	Population 2010	Population 2020	Change (2020 less 2010) Number	Change (2020 less 2010) Percent
Commonwealth of the Northern Mariana Islands...	**53,883**	**47,329**	**-6,554**	**-12.2**
Northern Islands Municipality.....	**0**	**7**	**7**	**X**
District 4.....	0	7	7	X
Municipality subdivision not defined.....	0	0	0	X
Rota Municipality.....	**2,527**	**1,893**	**-634**	**-25.1**
District 7.....	2,527	1,893	-634	-25.1
Municipality subdivision not defined.....	0	0	0	X
Saipan Municipality.....	**48,220**	**43,385**	**-4,835**	**-10.0**
District 1.....	15,160	13,633	-1,527	-10.1
District 2.....	6,382	5,489	-893	-14.0
District 3.....	15,624	14,115	-1,509	-9.7
District 4.....	3,847	3,416	-431	-11.2
District 5.....	7,207	6,732	-475	-6.6
Municipality subdivision not defined.....	0	0	0	X
Tinian Municipality.....	**3,136**	**2,044**	**-1,092**	**-34.8**
District 6.....	3,136	2,044	-1,092	-34.8
Municipality subdivision not defined.....	0	0	0	X

7: Housing Unit Change in CNMI 2010-2020

Housing Unit Counts of the Commonwealth of the Northern Mariana Islands: 2010 and 2020

Geographic area	Total Housing Units 2010	Total Housing Units 2020	Change (2020 less 2010) Number	Change (2020 less 2010) Percent
Commonwealth of the Northern Mariana Islands.....	**20,850**	**18,290**	**-2,560**	**-12.3**
Northern Islands Municipality.....	**0**	**10**	**10**	**X**
District 4.....	0	10	10	X
Municipality subdivision not defined.....	0	0	0	X
Rota Municipality.....	**1,049**	**912**	**-137**	**-13.1**
District 7.....	1,049	912	-137	-13.1
Municipality subdivision not defined.....	0	0	0	X
Saipan Municipality.....	**18,683**	**16,523**	**-2,160**	**-11.6**
District 1.....	5,479	4,922	-557	-10.2
District 2.....	2,527	2,107	-420	-16.6
District 3.....	6,775	6,080	-695	-10.3
District 4.....	1,379	1,197	-182	-13.2
District 5.....	2,523	2,217	-306	-12.1
Municipality subdivision not defined.....	0	0	0	X
Tinian Municipality.....	**1,118**	**845**	**-273**	**-24.4**
District 6.....	1,118	845	-273	-24.4
Municipality subdivision not defined.....	0	0	0	X

8: 2020 CNMI Population by Village

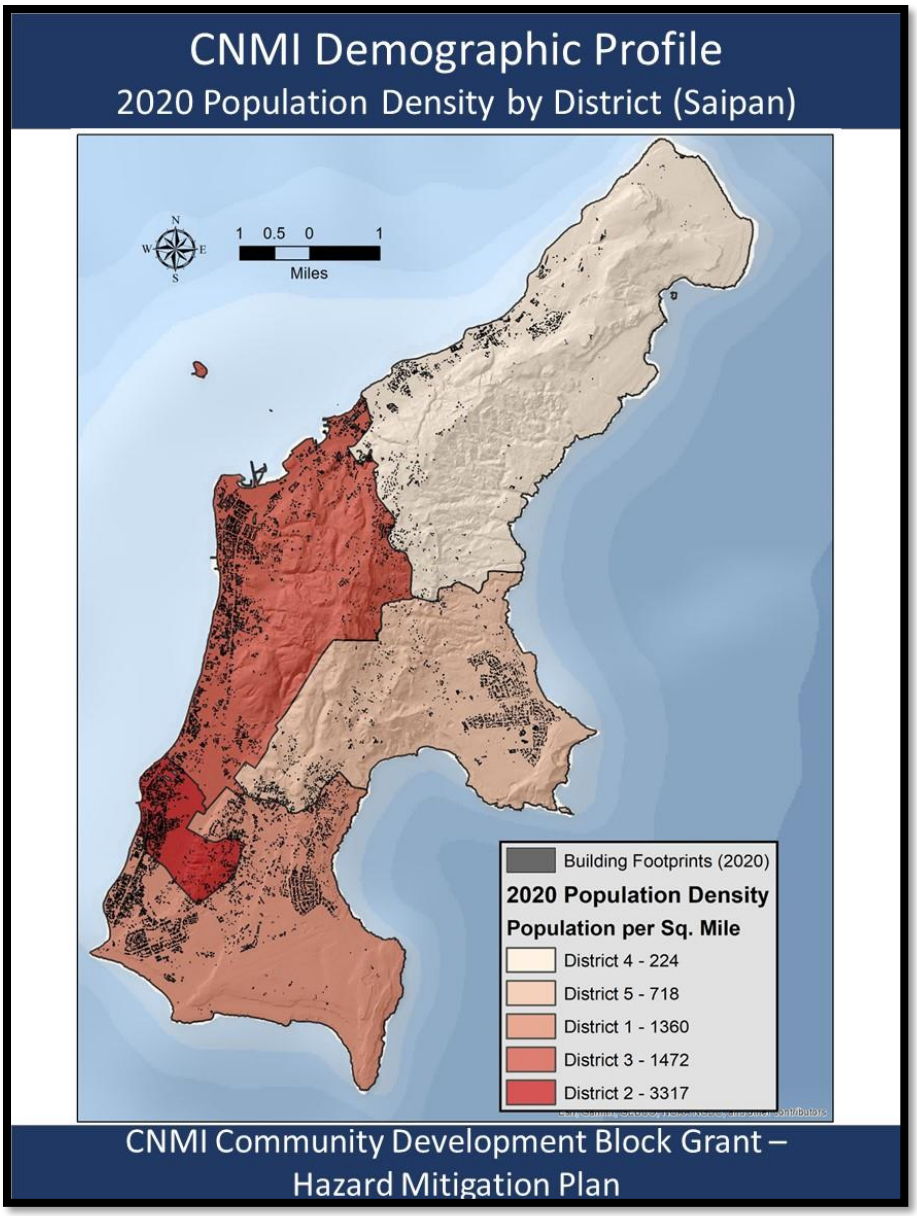


Total Population and Housing Units

In 2000, the population of the Northern Mariana Islands stood at 69,221. A decade later and according to the 2010 U.S. Census, the population dropped to 53,883, and has since decreased to 47,329 (U.S. Census Bureau 2020). While initial drops in population could be attributed to the demise of a major economic driver in the CNMI (e.g. the garment industry), the more recent decrease of 12% from 2010 to 2020 has not been attributed to any one cause, but may have been partially influenced by recent disaster impacts.

Broken down by census district, population decreases on Saipan were highest in District 2, which was one of the most heavily impacted areas during Typhoon Yutu. Likewise, the greatest reductions in housing units (outside of Rota and Tinian, which experienced the largest loss of units) occurred in District 2. As seen in Figure 9, the highest population densities in CNMI are concentrated on the western coastal plain of Saipan, which exacerbates community vulnerability due to overlapping flood zones (detailed further in Section 3).

9: 2020 Population Density by District (Saipan)



Population by Age

In 2017, a majority of the population was aged 25 to 54 years, with residents aged 35 to 54 accounting for the largest share of the population, at 33.4 percent. The population as a whole fell by 3.0 percent over 2010 to 2017 time period due to a sharp decline in the number of

residents aged 25 to 34, and children aged less than five years with a decrease of 25.8 percent and 24.8 percent, respectively. As a result, the composition of the population by age shifted markedly over the decade as the share of residents aged 5 to 19 rose about 28.7 percent and the share of residents aged 55 to 64 grew by 11.1 percent. The publication of 2020 decennial census data may yield additional insight into these trends, which should be factored into future mitigation planning efforts.

Education

Of the qualifying population, 83% have a high school degree, GED, alternative credential or higher and 15.5% hold a bachelor's degree or higher according to the CNMI Department of Labor 2017 Labor Participation Survey. Level of educational attainment is just one of dozens of variables that factored into the social vulnerability analyses described further in Section 3.2.2.

Vulnerable and Special Needs

The CNMI will promote housing for vulnerable populations including children and elderly residents, residents with disabilities, and the homeless population. These populations have a broad spectrum of characteristics, similar to the population at large, but a distinguishing factor for them is an increased risk of homelessness due to the fragile nature of their existence, some relying heavily on others for their care, others living on fixed incomes and vulnerable to hardships caused by sudden demands on their resources. The activities that will address the needs of these vulnerable and special needs populations include the Housing Voucher Program and NHMC's continuing development of affordable housing units.

Of the total civilian non-institutionalized population, 5 percent of adults 18 years and older have a disability and 1 percent of children under the age of 18 are disabled. Of the total civilian non-institutionalized population who are 65 years and older, 1 percent have a disability. According to the 2010 Census, only 42 percent of disabled adults are employed while 83 percent of non-disabled adults are working. Populations with disabilities were factored into the demographic analyses that inform the Action Plan's social vulnerability maps and mitigation priority areas (Section 3.2.2.).

Homeless and At-Risk of Homelessness

Homeless and persons at risk of homelessness have increased by approximately 33% since the storm events of 2015 and 2018. This increase is mainly due to the loss and damage to the housing stock. The Commonwealth of the Northern Mariana Islands Homeless Coalition was established in 2017, which included the creation of the CNMI Homelessness Coalition Board. To help address homeless/homelessness needs, and the following partner entities, agencies, and organizations have been identified as key stakeholders: Division of Youth Services, Karidat Social Services, Salvation Army, Division of Youth Affairs, and the Northern Marianas Coalition Against Domestic and Sexual Violence.

Additionally, to support and address homelessness, the NMHC administers the Emergency Solutions Grant (ESG) Program and provides homeless individuals and families with rental and utility assistance for a period of 12 months. There is one Homeless Coalition located in the Commonwealth known as the CNMI Homeless Prevention Coalition. The coalition has been operating for almost a year now and assists with homelessness initiatives.

While homelessness is not a specific variable within the plan's consideration of social vulnerability, the housing construction types and associated risk of severe damage in disasters

is factored in. Thus a potential contributing factor to homelessness in the wake of disasters is built into the prioritization of mitigation areas.

Transitional, Permanent Supportive, and Permanent Housing Needs, and Individuals and Families that are Homeless or At-Risk of Homelessness

The CNMI currently does not have transitional housing. There is one Homeless Coalition located in the Commonwealth known as the CNMI Homeless Prevention Coalition. The coalition is described above, and has been operating for almost a year now and assists with homelessness initiatives. This Agency is working towards needs and solutions for permanent supportive and permanent housing need solutions. Temporary housing is provided through the Emergency Solutions Grant Program, funded through HUD and administered at NMHC and through the Emergency Food (and Shelter) Program, administered by Karidat Social Services and funded through the United Way. All organizations that currently exist in the CNMI work diligently towards one common goal: to provide affordable housing, supportive services, and community development assistance to homeless and special needs populations.

On an annual basis, NMHC implements the following efforts:

i. Continue to administer the ESG program and conduct case management for literally homeless and at risk of homelessness households.
ii. Support the work of non-profit organizations and the public sector providing assistance to very low and low-income individuals, and special needs populations.
iii. As the statistics have been gathered for the number of people living with AIDS in the CNMI, and although the number is rather small, the NMHC will identify funding to support the CNMI's special needs population (particularly for housing assistance).
iv. Continue to support the revitalization of programs implemented by the Transitional Living Center who offers services to those who are likely to become homeless after being discharged from a publicly-funded institution (prison, mental institution, etc.) and the Independent Living Center who offer life skill training to the special needs' population.
v. Continue to support the operations of the only two existing shelters (whether through CDBG or ESG) in the CNMI - The Guma Esperansa Shelter (serves domestic violence victims who are considered homeless), and the Division of Youth Shelter Services Shelter (serves youth who are victims of child abuse and neglect/runaway youth).
vi. Within the next five years, annually conduct a point in time survey to gather more accurate information on homeless households in the CNMI, and once the data is gathered, apply for a Continuum of Care Program grant in order to meet the homeless needs in the CNMI (Target date: Year 3 of the Consolidated Plan).
vii. Acquire, construct, rehabilitate, or convert structures for use as housing for special needs and homeless populations.
viii. Acquire, construct, rehabilitate or convert structures used as public facilities to provide services for special needs and homeless populations (i.e., soup kitchens, outreach facilities, etc.)

Homeless Prevention

The CNMI desires to prevent low-income individuals and families with children (especially those with incomes below 30 percent of the area median) from becoming homeless. Individuals and families who are at-risk of becoming homeless are provided assistance such as security and utility deposits, rental and utility arrears, and up to 12 months of rental and utility payments.

Persons receiving assistance are also provided case management and other support services for families to achieve housing stability.

Non-Homeless Special Needs Assessment

HUD identifies special needs populations to include the elderly, frail elderly, persons with physical and developmental disabilities, substance abusers, persons with disabilities (mental, physical, developmental, persons with HIV/AIDS and their families), persons with alcohol or other drug addiction, public housing residents, and victims of domestic violence, dating violence, sexual assault, and stalking. This segment of the population has a wide variety of needs and there are local and regional support services to help address those needs. Many of these needs are being met through local public services and without public assistance.

Based on the 2010 Census data for the CNMI, of the total population 60 years and older, 16 percent are below the poverty level, and 19 percent of the population has a disability. There was also a 59 percent increase in households whose ages ranged from 65-74 years old in renter-occupied units, while there was a 29 percent increase in households within the same range in owner-occupied units. As with the elderly population, for those ages 75-84, there was a 50 percent increase in households since 2000 and a 31 percent increase for those 85 and over in owner-occupied units. For the renter-occupied units, there was a 36 percent increase in households ages 75-84, and a 50 percent increase in households ages 84 and over.

Data gathered on persons with alcohol and other drug addiction has been minimal in the CNMI. Data for FY 2014 gathered from the Community Guidance Center of the Department of Public Health (now known as the Commonwealth Healthcare Corporation) indicated that a total of 27 individuals were identified to have alcohol or other drug addiction. The CNMI Governor Ralph Deleon Guerrero Torres has dedicated substantial resources to fighting substance abuse and established the Substance Abuse, Addiction, and Rehabilitation (SAAR) Program. A facility dedicated entirely to addiction was opened in Saipan in 2017 by SAAR called the HOPE Recovery Center. At its facility in Saipan, the Community Guidance Center provides substance abuse treatment to adults, adolescents, and children, and its programs have been particularly successful in curbing drug and alcohol abuse among youth in the Northern Mariana Islands.

Housing Market/Stock Profile/Economic Hardship

There was a total of 16,707 households in the CNMI in 2017, with 7,669 of those living in a one-family detached house. In 2017, 9,136 households rent their home for cash, while only 1,101 owned their home with a mortgage or loan. In addition, another 3,103 households owned their home free and clear and 3,366 households occupied their homes without payment. Households with 2 bedrooms were most common in the CNMI in 2017, with 6,134 households living in a 2-bedroom home. Housing costs varied throughout the Commonwealth. Rents were highest in Saipan's District 5 at $251-$300 each month. This was followed by $201-$250 in Districts 1 and 3. In Tinian, the median rent was $100-$130 and was $100 in Rota. More than a quarter of housing units in Districts 2 and 4 were worth less than $50,000. Meanwhile, more than 35.1 percent of housing units in Rota and Tinian were valued between $50,000 and $100,000 in 2017. In District 5 in Saipan, 19.8 to 30.2 percent of housing units were valued between $100,000 and $150,000, and 19.1 to 25.5 percent were valued between $150,000 and $300,000.

2.1.4 Identified Hazards of Concern

The risk assessment used for the CNMI 2018 SSMP, and incorporated into this CDBG-MIT Action Plan, evaluated multiple natural hazards, and constitutes a strong foundation for initial assessment and prioritization of mitigation needs. Within the SSMP a full range of natural hazards were considered, and those presenting the greatest concern due to historic frequency and magnitude were identified. The process incorporated review of state and local hazard planning documents, local and federal mapping data and analyses, and expert input from key CNMI agencies. Hazards that were considered included tropical cyclones, earthquakes, tsunamis, volcanic activity, coastal and inland flooding, drought, and wildfire. This Action Plan augments this foundation with additional assessments and data published since 2018, including information on wildfire risk, special wind zones, and exacerbating factors from climate change (e.g. loss of natural coastal defense infrastructure in the form of coral reef degradation).

2.1.5 Hazard Profiles and Analysis

Over the years, several individual and multi-hazard assessments and mapping activities have been carried out in the CNMI. Figure 10 provides a hazards matrix that was compiled by the CNMI Homeland Security and Emergency Management Office, which identified the hazard types that could potentially impact the CNMI islands. The matrix also categorizes hazards data that were either 1) available at the time, 2) available but needed updating, or 3) if data collection was required. To the extent permitted by newly available data, this plan supplements the SSMP with mitigation-pertinent information concerning each hazard.

10: CNMI Hazards Matrix (CNMI SSMP 2018)

Hazard Type	Profile Hazard Events	Assess Vulnerability by Jurisdiction	Assess Vulnerability by State Facility	Estimate Losses by Jurisdiction	Estimate Losses by State Facility
Typhoon	C	A	A	A	A
Flooding	C	C	A	A	A
Earthquake	BA	A	A	A	A
Volcanic Eruption	A	A	A	A	A
Tsunami	A	A	A	A	A
Codes: A-Requires Data Collection; B-Data Available, Need Update; C-Current Data Available					

Substantial additions to hazards-related data for CNMI have occurred since the 2018 SSMP, particularly for “Profile Hazard Events” and “Assess Vulnerability”. In the table above (figure 10), the data status codes for typhoons, flooding, and tsunami can be considered current (‘C’) for assessment purposes, while data is also available for loss estimates. The latter still requires updates in the form of revised valuations and inventories for infrastructure, building stock, and critical facilities, and therefore can be considered to have a status of ‘B’ (data available; need update). Recent data acquisitions and updates are incorporated into the hazard profiles and mitigation prioritization analyses (Section 3) in this action plan.

Typhoons

Two principal types of storm activity impact the CNM: small to meso-scale systems that consist of thunderstorms and squalls, often associated with southwesterly monsoon surges and trade wind disturbances, and large, cyclonic low-pressure systems of tropical storms and typhoons that can dominate an area over 300,000 square miles and persist in the Micronesia region for over a week's time. The latter dominate conversations around risk and hazard mitigation in the Marianas.

The months of July to mid-December are characterized as the seasonal period for enhanced tropical disturbance and cyclone activity in the Marianas. A tropical disturbance is a loosely organized area of thunderstorms that maintains its identity for 24 hours or more and originates over ocean waters. A tropical depression is an organized system of clouds and thunderstorms with defined circulation and maximum sustained winds of 38 mph that may include localized rain and thunderstorms. Tropical storms have defined circulation and maximum sustained winds of 39-73 mph and usually are accompanied by heavy rains and thunderstorms. Typhoons are severe tropical cyclones that occur within the Western Pacific and attain a minimum sustained wind speed of 74 mph. Typhoons evolve as air moves around a center of low pressure, reaching maximum velocity in a circular band extending outward 20 or 30 miles from the rim of the eye (center). Previous wind speeds during severe typhoons have been recorded with gusts as high as 160 to 235 mph. A super typhoon is defined as a storm system that has sustained winds of 150 mph (130 knots) or greater.

During a typhoon, high winds, wave run-up, storm surge and small-scale wind bursts may damage or destroy homes, businesses, public buildings and infrastructure. Termed "microbursts", short-duration localized winds within these systems may reach wind speeds in excess of 200 miles per hour. In addition to severe winds, typhoons have several other characteristics. Barometric pressure is very low, for example, usually 29 inches of mercury or less. Typhoon winds are directly related to the lowest barometric pressure reading at the center of the storm.

Typhoon winds are strongest near the radius of maximum winds, the area within the storm path near the lowest central pressure. In general, an increase in the radius of high winds leads to a larger area of maximum destruction. Wind speeds decrease as the distance away from the radius of maximum winds increases. See Figure 11 for details on the range of impacts from a typhoon.

11: Impact Elements of a Typhoon (CNMI 2018 SSMP)

Element	Characteristics
Hazard	• Wind • Rain • Waves • Flooding • Storm Surge
Exacerbation	• Local tides • Local coastal configuration
Results	• Wind damage from typhoon and spawned micro-bursts and mini-swirls • Storm surge and wave damage • Coastal stream/wetland flooding • Mudslides/landslides in low-lying areas
Losses	• Structures and contents, including lifeline structures and equipment, such as roads, bridges, and roadway culverts • Lives and injuries • Communications • Beach erosion • Fire • Shipping and fishing • Soil fertility from saline intrusion • Vegetation • Crops • Livestock • Pollution • Infrastructure (e.g., water, electricity, sewer) failure

While tropical cyclone forecasting and track prediction has improved substantially over the last decade, the movement of these systems can still be erratic and unpredictable at local and sub-regional scales, with changes in forward speed, trajectory, and “wobbles” in the storm track all having significant implications for small island communities. The surge action attributable to storms can cause severe erosion of coastal areas and can salinize land and groundwater resources, contaminate fresh water supply, cause agricultural loss, and damage surrounding physical structures. Further, strong winds can cause tremendous amounts of debris to become projectiles and can also damage crops and destroy lightly constructed structures.

Not all of the storms that impact the CNMI will directly intersect the island landmasses themselves. More commonly, near misses generate large swells and moderately high winds causing varying degrees of damage. Despite the fact that a typhoon may have missed landfall on a given island community, impacts from a near miss can be severe and lead to flooding, beach erosion, large waves, high winds, and wave over-topping of coastal infrastructure.

In the event of a tropical cyclone track forecast that intersects CNMI coastal waters, the CNMI HSEM issues either a typhoon “warning” or “watch”, indicating the forecasted proximity and length of time before the arrival of tropical storm-force or typhoon-force winds. Watches, warnings, and other tropical cyclone advisories are initially generated by the National Weather Service on Guam, and then relayed through appropriate state and territory authorities such as CNMI HSEM. Within the CNMI, there are four conditional settings that demarcate the estimated time of arrival of a typhoon:

- Condition IV: Estimated Time of Arrival within 72 hours.
- Condition III: Estimated Time of Arrival within 48 hours.
- Condition II: Estimated Time of Arrival within 24 hours.
- Condition I: Estimated Time of Arrival within 12 hours

Wind Pressure

Pressure differentials caused by typhoon winds may simulate vacuums within buildings, commonly causing breakage of window glass or failures of overhead doors. The internal pressures add to the external forcing, producing more severe stress on the structural components. The roof is then subjected to tremendous internal pressure building from inside, together with the external wind pressures lifting the roof from outside. The resulting combined forces may be too intense, even for well-structured roof systems. Subsequent damage from high winds and rain to the interior and content often results after a roof is torn away from a structure.

Coastal Flooding & Storm Surge

Coastal flooding can be defined as temporary inundation of areas following a breach in critical shoreline elevations or coastal riverine floodways, caused by a rise in sea level and/or waves. Coastal flooding is caused by such phenomena as high surf, storm surge, prolonged strong onshore flow of wind, high astronomical tides, and tsunamis. Storm surge is a phenomenon caused by the extreme low pressure and strong winds that exist around the eye of a tropical cyclone, which causes a dome of water to form at levels higher than the surrounding ocean surface. Large swells, high surf, and wind-driven waves ride atop this dome as it impacts land areas, causing severe flooding in coastal areas, particularly when storm surge coincides with normal high tides, thereby creating conditions of inundation and flooding to occur in the low-lying coastal areas.

About 90% of the deaths experienced in the past near the coast resulting from typhoons are caused not by wind, but by storm surge. The height and inland extent of storm surge along the open coast depends on a number of factors, which include: (1) wind speed and associated barometric pressure, (2) depth of water or shoaling factor, (3) storm trajectory, and (4) speed of the storm. Coastal configuration in the form of estuaries or bays can cause a funneling or amplification effect, exacerbating the surge. Fortunately, the Northern Mariana Islands have very few bays or estuarine features. Coincidence with high tide will also increase surge magnitude.

Indirect costs from typhoon impacts include the widespread distribution of debris, accidental spills of fuel, sewage and industrial waste, household chemicals, or other contaminants onto the land or into the marine environment; in addition to environmental damage associated with storm debris or material cleanup, including the loss of landfill capacity. As experienced with previous typhoons within the Mariana Islands, post -storm debris management can be another problem.

This occurs when vast amounts of vegetation and building debris, including potentially toxic, treated building materials, are exposed there.

The damage to and destruction of the built environment, particularly public infrastructure such as transportation, utilities, and communications often represents enormous economic, social, and general functional costs to a community, while also impeding emergency response and recovery activities. A nonfunctional road can have major implications for a community: general loss of productivity; disruption of physical access preventing residents from getting to work or other daily activities, and prevention of emergency vehicles from reaching their destinations. This causes disruption to critical lifeline supplies.

Damaged or destroyed utility lines and facilities including electricity, computer and satellite links, gas, sewer, and water services has crippled basic community functions in the CNMI in the past. Power lines are often badly damaged or destroyed, resulting in the loss of power for days, weeks, or even months. In addition to basic modern households' appliances being affected, public water supplies, water treatment, and sewage facilities are often impacted. Electric pumps cannot pump drinking water into an area without power. Disaster victims who do get water may have to boil it to eliminate waterborne pathogens introduced to the supply in damaged pipelines.

Typhoons in CNMI

Typhoons and tropical storms have been a common occurrence throughout human occupation of the CNMI. The hazards resulting from Typhoons Pongsona, Chata'an, Soudelor, Mangkhut, Yutu and many others have been due to extreme winds, heavy rain and extreme wave run-up. These storm conditions have caused structural damages to buildings, utilities, roads, ports, boats, and the loss of agricultural crops. The damages from loss of electric power generation and distribution sources resulted in the loss of other essential services such as public water supply and public sewage waste disposal. Sustained winds for many hours caused extensive structural damages to residential buildings and some public and commercial buildings. In general, damages are especially severe to buildings constructed with wooden framing and corrugated tin walls and roofs.

With previous storms, damage to primary power distribution lines, downed power poles, and water damage to the transformers have caused major failures in the electrical system. As such, the emergency restoration of the power distribution system to the water wells has been made a top priority to provide water services as soon as possible. In past events, temporary generators were installed to provide power to some of the water wells. The lack of power and water combined with the CNMI's inability to dispose of unsanitary waste increases the risk of diseases and epidemic. A succinct history of notable storm systems is outlined below.

Typhoon History

In April 1968, Typhoon Jean brought total destruction to public and private facilities within the Mariana Islands. Estimated losses equaled $18 million with more than 1,000 homes lost in addition to livestock and crops. However, no lives were lost.

In December of 1986, Typhoon Kim, with maximum sustained winds of 135 mph, swept across the island of Saipan for nearly 12 hours causing major destruction to public and private facilities. The total loss to public facilities, residential, agricultural crops, and livestock equaled $25 million.

In 1997, two major storm systems struck the Northern Mariana Islands. According to the final disaster report of the American Red Cross, Super Typhoon Keith, which produced sustained winds of over 160 mph in November 1997, caused significant damage on Saipan, Tinian, and Rota. Over 106 homes were destroyed and another 477 homes sustaining major damage, which were primarily constructed out of metal or wood. Less than month later, Super Typhoon Paka crossed near Rota with heavy rain and sustained winds of 160 mph, with gusts as high as 175 mph. The island of Rota was declared a major disaster area with extensive damage to homes, public facilities, infrastructure, and agriculture.

TS 08W was named Tropical Storm Chata'an (pronounced tsa-Ta-an) by the Japan Meteorological Agency, RSMC-Tokyo at 0600 UTC on June 29, 2002. The monsoon trough in which Chata'an was embedded brought heavy rains and strong winds to a large portion of the tropical western North Pacific, including Pohnpei State and Chuuk State. Shortly thereafter, Chata'an took a more westward track toward the Rota Channel and northern Guam. The eye entered the northeast side of the island at about 2130 UTC on July 4, 2002 and exited the northwest side of the island about 0000 UTC on July 5, 2002. The northern edge of the eyewall most likely stayed in the Rota Channel and inflicted major damage to agricultural parcels on the island of Rota.

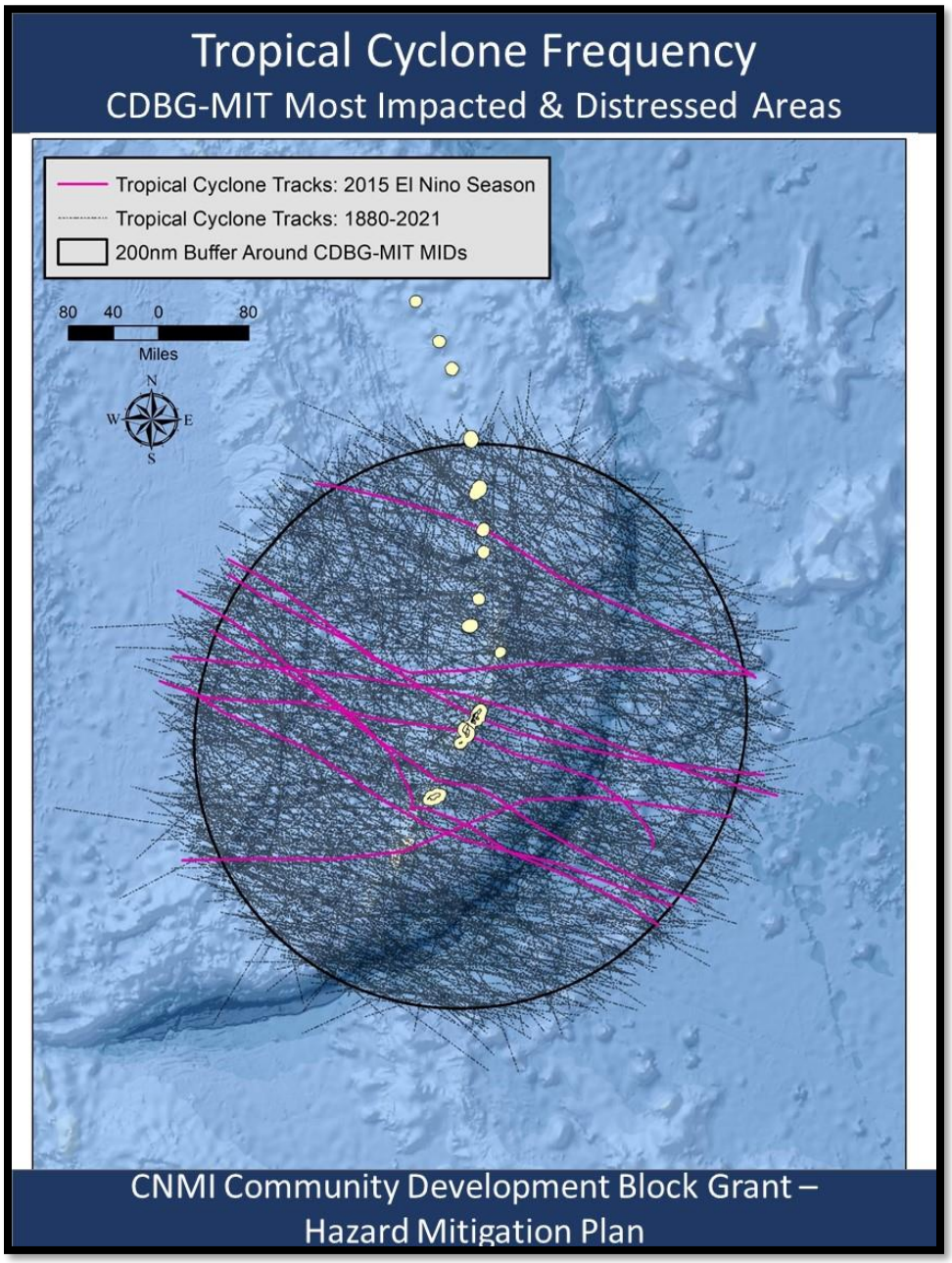
On December 2, 2002, a tropical disturbance began to organize near 6.5N 165E, or about 370 miles east of Pohnpei. At 1100 UTC on December 2nd, the Joint Typhoon Warning Center issued a Tropical Cyclone Formation Alert indicating that the circulation associated with the disturbance was likely to become a significant tropical cyclone in the subsequent 12 to 24 hours. At 0000 UTC on December 3rd, the JTWC upgraded the Depression to Tropical Storm (TS) 31W as it continued on a northwest track. TS 31W was named Tropical Storm Pongsona (pronounced Bong-sahn-WAH or Pong-sahnWAH) by RSMC-Tokyo at 1200 UTC on 3 December, as it took a more westward track.

In the 18-hour period from 1800 UTC 7 December until its peak intensity at 1200 UTC on December 8, Pongsona intensified from 105 knots (121 mph) to 130 knots (150 mph), reaching the super typhoon status of 130 knots (150 mph) while the center of the eye was northwest of Guam and the southeastern eye wall cloud was just off of the northwestern coast of the island. After passing over Guam, Pongsona continued on a northwest track, where it also pummeled Rota, especially the southwestern part of the island. After passing west of Rota, the intense typhoon moved to the north, west of Tinian and Saipan.

On Rota, high water marks were taken at Song-song Village. At Song-song, the deepest inland high-water mark was recorded 613 feet (187 meters) inland from the shoreline. This site is at the crest of the peninsula that makes up the main base of the town of Song-song. The storm surge came from the south and nearly crested over the width of the peninsula for a distance of about two football fields. The highest elevation measured was at 23.6 feet (7.19 meters). On the northwest side of the peninsula at the West Harbor, the inland reach was 78.74 feet (24 meters) and the elevation was 11.6 feet (3.54 meters).

The East Harbor on Rota disappeared under the power of the storm. Further, cargo containers fell into the West Harbor. Clearance of the channel in the West Harbor was a priority in order to receive supplies and relief material. However, the water system on the island remained intact during the storm and remained in service. Rota High School was the designated shelter but its gym and other buildings no longer serve as shelters due to structural inadequacies.

12: Tropical Cyclone Tracks within 200nm of CDBG-MIT MID Areas



Over the last two decades the CNMI has been affected by 11 typhoons with peak winds in excess of 100 mph. Most of these extreme storms caused millions of dollars in damages. At the time of typhoons Mangkhut (August 2018) and Yutu (October 2018), the Islands were still and most recently recovering from Typhoon Soudelor that caused catastrophic damage to Saipan in 2015. Soudelor received only FEMA assistance and did not receive HUD CDBG-DR funds so recovery efforts have been slow and on-going. Preliminary assessments of Yutu indicated that it caused up to five times the damage of Soudelor.

CNMI was struck with Mangkhut and Yutu within a 45-day window. The islands of Saipan, Tinian, and Rota were within National Weather Service advisory and warning areas for Typhoon Mangkhut, which had sustained winds of 100 mph when the eye passed over Rota. Mangkhut damaged homes, caused power outages and knocked down power poles, flooded some areas, and uprooted large trees.

Super Typhoon Yutu caused far more major damage, passing directly over Tinian and the southern end of Saipan. The overall economic impact and the destruction of housing were profound and critical infrastructure was compromised. The effects of both Typhoon Mangkhut and Super Typhoon Yutu continue to be wide-ranging.

Yutu caused complete destruction of Saipan's commuter terminal servicing Tinian and Rota. Initial impacts from Yutu closed the Saipan International Airport for twenty days with eight airlines canceling flights for 22 days. Five hotels sustained major damage and major tourist sites were also heavily damaged. In November 2018, the CNMI visitor rate dropped by 42,000 as compared to the same month from the previous year. Given a near total loss to the CNMI's primary economic driver, these storms had major impacts on employment and tourism-based businesses.

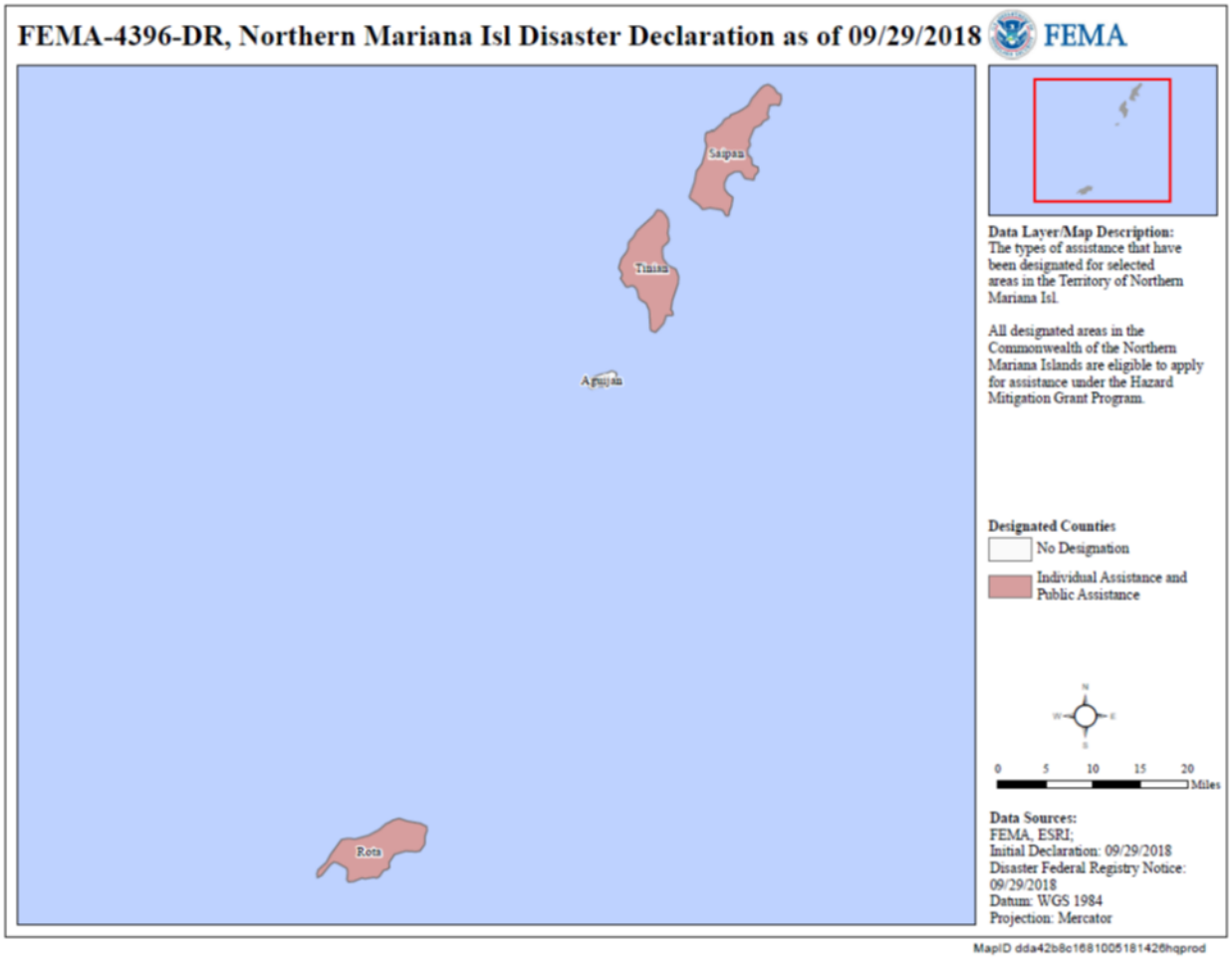
Needs Assessment (Mangkhut and Yutu)

The CNMI compiled assessment data utilizing local and federal resources, including information from FEMA, HUD, SBA, and other federal and local agencies and organizations. This needs assessment included specific details about unmet needs within the eligible and most impacted and distressed communities.

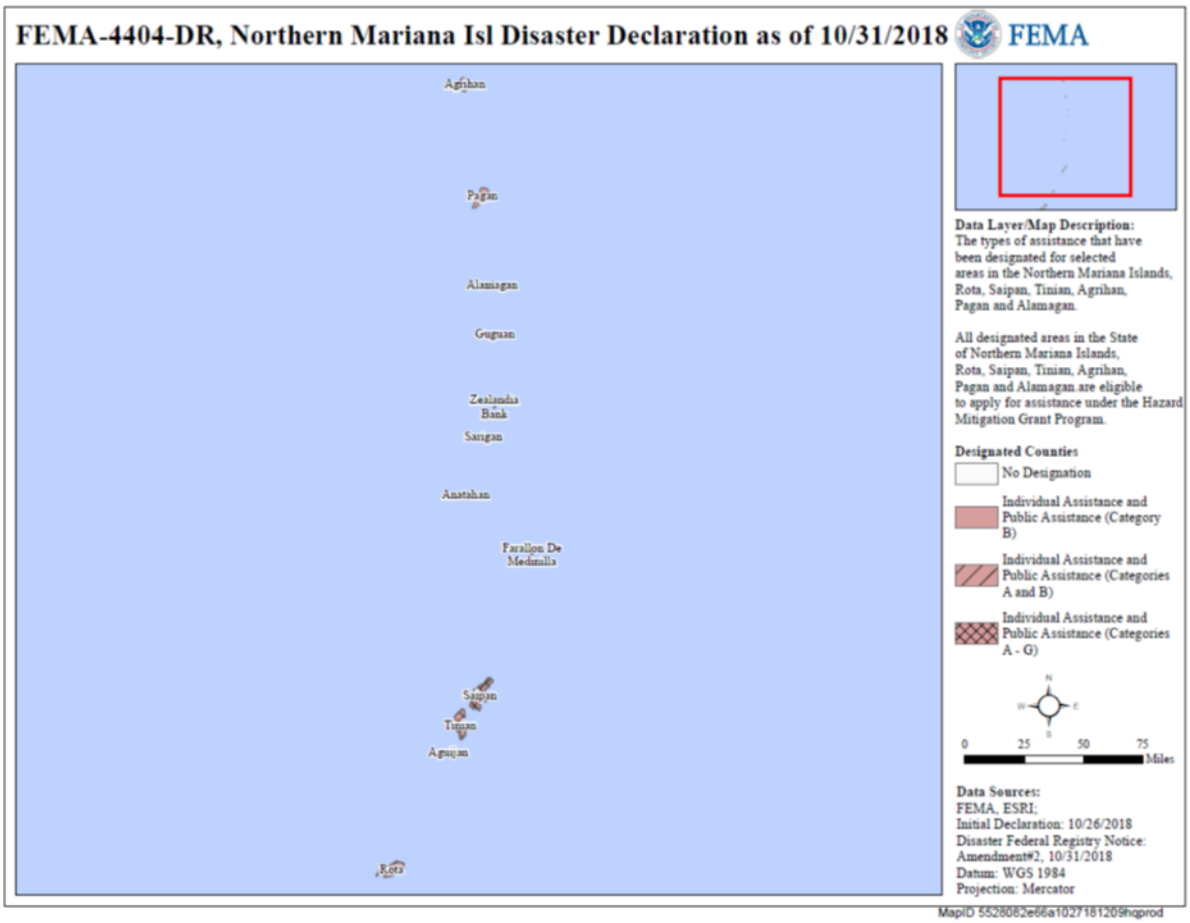
Under DR 4396 (Typhoon Mangkhut), FEMA approved 395 applications totaling $1,011,549.70 for Individual Assistance with an obligation of $3,833,508.47 for Public Assistance Grants. Unfortunately, a little over a month later, the Super Typhoon created even more devastation and impacts across the Islands. Under DR 4404 (Typhoon Yutu), FEMA approved 6,958 applications totaling $41,465,716.52 for Individual Assistance with an obligation of $169,472,960.95 for Public Assistance Grants. All areas of Saipan, Tinian, and Rota were designated by FEMA for IA and PA funding as demonstrated by the disaster declarations in Figures 13 and 14. The damages from both Typhoons make it one of the costliest, if not the costliest back-to-back storm events in the Commonwealth's history.

The Islands of Saipan and Tinian were designated as Most Impacted and Distressed Areas by HUD's most impacted areas formula. The need for the Islands is significant and the HUD allocation of CDBG-DR funds will address a portion of the needs. To demonstrate the unmet needs, the CNMI utilized the best available data from the U.S. Census, FEMA, SBA, and other sources. The Preliminary Damage Assessment Report from FEMA used to determine the major disaster declaration indicates that over 700 residences were impacted with less than 6 percent of the residences insured. To support the needs assessment data, the American Red Cross estimated that over 51,000 persons and over 19,000 households were impacted by wind. The damage from wind severely impacted communication, power, and transportation. The estimated rainfall over the Islands during the storm was 6 to 9 inches causing flooding in low lying areas.

13: Disaster Declaration for Typhoon Mangkhut



14: Disaster Declaration for Typhoon Yutu



Below (Figure 15) is a summary of the total unmet recovery need by category and demonstrates how the CNMI has allocated disaster recovery funds based on those unmet needs. The CNMI allocated approximately 48 percent towards a variety of housing activities such as rehabilitation, reconstruction, new construction, and homeownership. Infrastructure is utilizing approximately 42 percent of the allocation and will fund major public facilities that were severely impacted by the storms. Economic Development is also addressed with approximately 4 percent of the funds allocated to support job and business stabilization and retention.

15: CNMI Disaster Recovery - Summary of Unmet Needs

CATEGORY	UNMET NEED	% OF UNMET NEED	CNMI CDBG-DR PROGRAM ALLOCATION AMOUNT*	% OF CNMI PROGRAM ALLOCATION
Housing	$420,274,767	44%	$123,221,000	48%
Infrastructure	$625,175,116	51%	$105,881,831	42%

Economic Development	$55,788,960		$8,660,000	4%
Total	**$1,101,238,843**		**$254,324,000**	

*Allocation Amount includes project delivery costs and does not include program administration.

Although seasonal outlooks and predictions for typhoon formation, tracks, and intensities are issued each year through National Weather Service - Guam, the Northern Mariana Islands can experience devastating winds from a well-developed storm or typhoon within 90 nautical miles from the islands during any month of the year. This is an important consideration for El Nino years, which are characterized by significant increases in the number and temporal range of tropical cyclone activity in the Marianas. Figure 12 highlights the storm tracks of 2015 to demonstrate this enhanced threat.

16: Percent Chance of a Tropical Cyclone Passage Within 200nm of Saipan

Month	Typhoon	Tropical Storm
January	2%	4%
February	1%	4%
March	1%	1%
April	5%	3%
May	8%	1%
June	1%	5%
July	11%	11%
August	7%	17%
September	20%	25%
October	25%	15%
November	14%	13%
December	5%	5%

To identify land areas that are potentially at risk, criteria were established based upon known historical trends with over-topping from storm surge and wave run-up, and its relationship to coastal topography. Figure 17 defines the criteria that have been used in the past (CNMI SSMP 2018) to categorize the hazard intensity of areas within the CNMI in relationship to potential impacts by typhoons and tropical storms.

17: Hazard Intensity Rating for Tropical Cyclones

Hazard	Low	Moderate	High
Costal Storm Inundation	No history of inundation	History of minor inundation	History of severe inundation up to 10 m marker. Coastal inundation within designated V and VE flood zones with base elevation up to 7 feet.
High Winds	No history of high wind activity.	History of periodic episodes of high winds with localized structural damage.	History of high winds with widespread structural damage.

In order to assess tropical cyclone risks using more recent data and tools, a composite flood risk index was derived from a dataset used in the 2020 CNMI Coastal Resilience Assessment (Dobson et. al 2020a), which allowed for identification of communities and infrastructure at risk to multiple flood hazards associated with both coastal and inland (rain-induced) inundation. The methods and associated results of these analyses are detailed in Section 3 of the Action Plan.

Tropical cyclone impacts and exposure were also assessed through use of recently published Special Wind Region mapping data (FEMA 2020) for CNMI.

Extreme Wind Zones (Typhoon Associated)

In support of implementing CNMI's adopted building code, as it relates to wind hazards, FEMA developed Special Wind Region (SWR) data to simplify the process of determining the design wind speed standards (FEMA 2020). The SWR maps for the CNMI incorporate the effects of island topography and provide an alternative method to the guidance found in the American Society of Civil Engineers (ASCE) *Minimum Design Loads and Associated Criteria for Buildings and Other Structures* (ASCE/SEI 7-16), which is referenced by the adopted 2018 IBC and 2018 IRC.

FEMA produced four SWR maps for each island to show the wind speeds related to each of the four Risk Categories of ASCE/SEI 7-16 (see Figure 18). The design wind speed values will increase for a particular location as the Risk Category number increases from I to IV to provide higher performance of more important buildings and structures. Each Risk Category map is associated with a mean recurrence interval (MRI), which can be understood as the average expected period of time between occurrences for that wind intensity. The mean recurrence intervals can also be described in terms of how often the winds will be expected to exceed the design values within a 50-year period.

18: Wind Risk Categories (source: FEMA 2020)

Risk Category	Description	Building Examples	Mean Recurrence Interval (MRI)	Probability of Exceedance in 50 Years
I	Buildings and other structures that represent a low hazard to human lifein the event of failure	Agricultural facilities, certain temporaryfacilities, minor storage facilities	300 years	15%
II	Buildings and other structures except those listed in Risk Categories I,III, IV	1- and 2-family dwellings, office buildings, retail buildings	700 years	7%

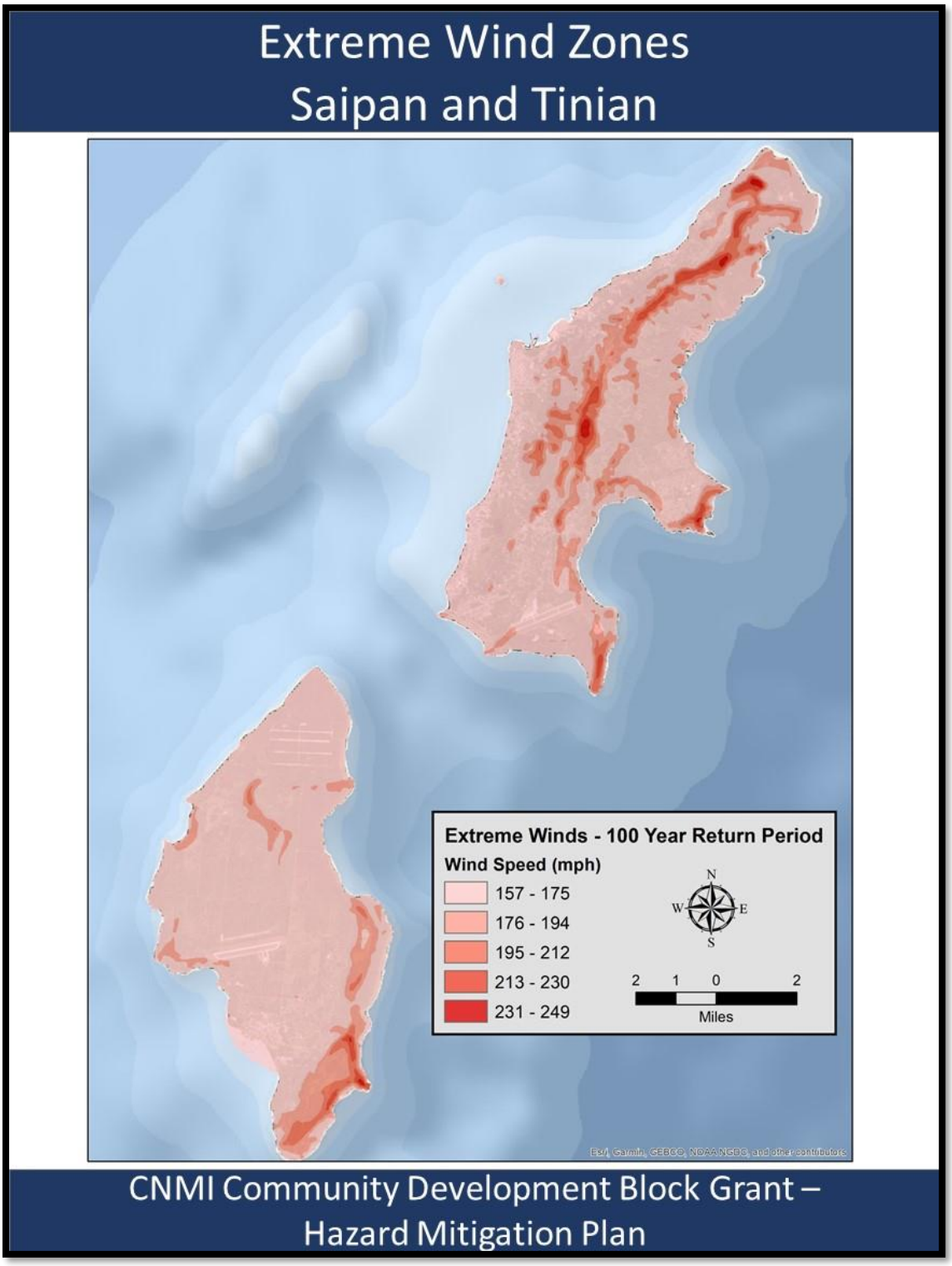
III	Buildings and other structures that represent a substantial hazard to human life in the event offailure	Educational facilities, buildings withpublic assembly loads greater than 300	1,700 years	3%
IV	Buildings and other structures designated as essential facilities	Ambulatory care facilities, fire and police stations, emergency shelters	3,000 years	1.6%

For the purposes of assessing extreme wind exposure and risk, spatial data from this work was processed and overlaid with the FEMA Hazus building stock database for the CNMI. Total structural values and building contents values within the upper quartile of wind intensities under risk category four were calculated. Without proper design standards and associated building practices in these areas, a total of $233 million in structural value could be at risk, as well as a total of $132 million in building content values.

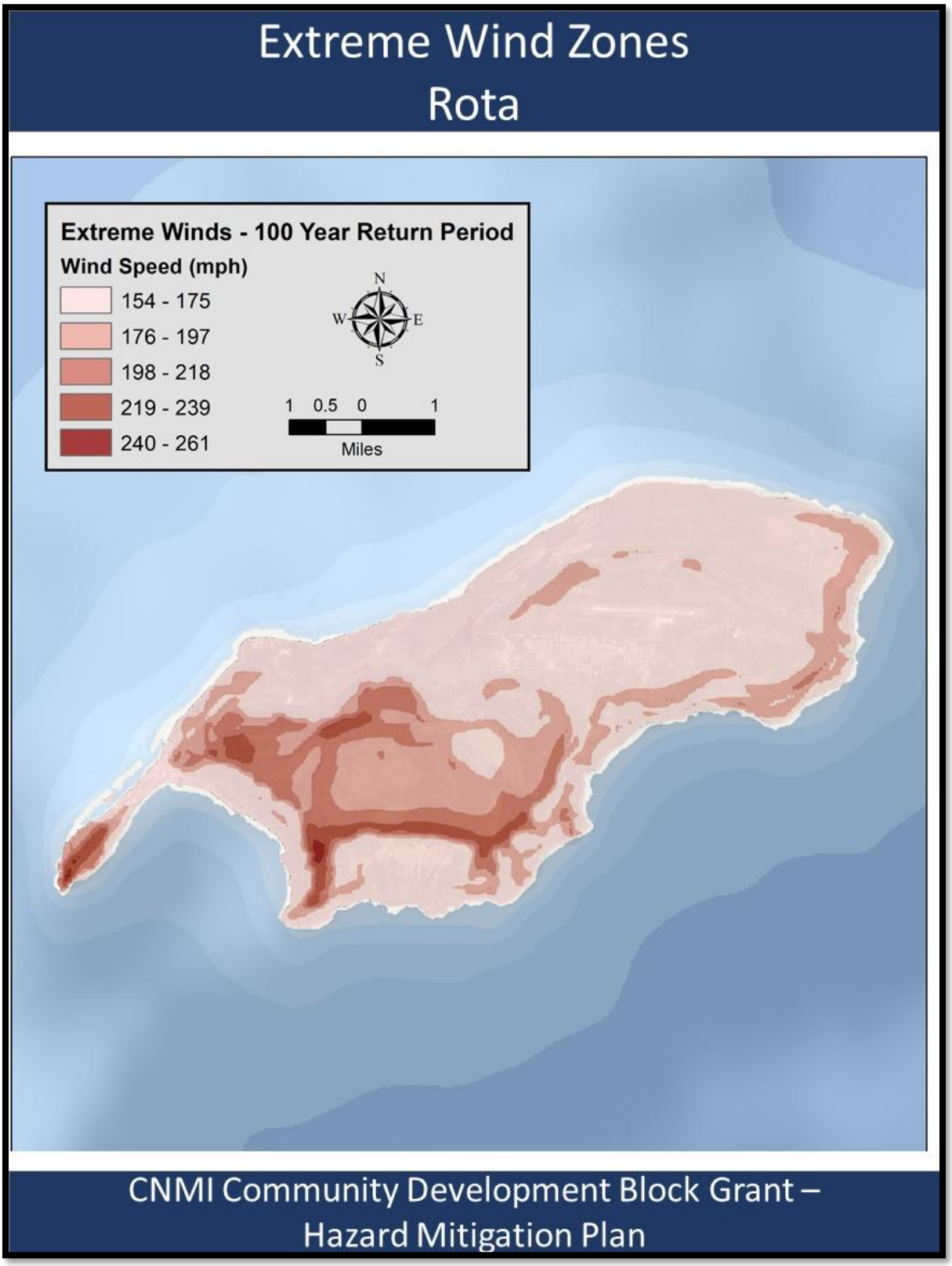
The maps on the following pages (Figures 19-20) highlight the 100-year return period wind intensities (calculated as 3-second gusts) on Saipan, Tinian, and Rota, illustrating the influence of topographic features on wind speeds.

Wind intensity values for the four risk categories, as well as the associated design standards for any point in the CNMI can be determined by using the “Hazards by Location” tool at https://hazards.atcouncil.org/ . The combined analyses of extreme winds, coastal inundation, and inland flooding constitute an assessment of typhoon hazard exposure that is perhaps the most critical among all hazards analyses in this action plan. These analyses provide the primary guidance in establishing mitigation priority sites and areas in Section 3.

19: Special Wind Zone Intensities for Saipan and Tinian



20: Special Wind Zone Intensities for Rota



Flooding

Floods are a temporary inundation of water with a landmass that stems from excessive rainfall or wave action. Flooding is the result of large-scale weather systems that generate prolonged rainfall patterns or on-shore winds. Flood problems can exist where development has encroached into identified flood plains, which are identified land areas that are adjoining to a channel, stream, ocean, or some other watercourse or body that are susceptible to flooding such as lakes and wetland areas. Floods have the potential and capability to undermine buildings and bridges, erode shorelines and coastal plain areas, destroy vegetation, and wash out access routes and transportation nodes.

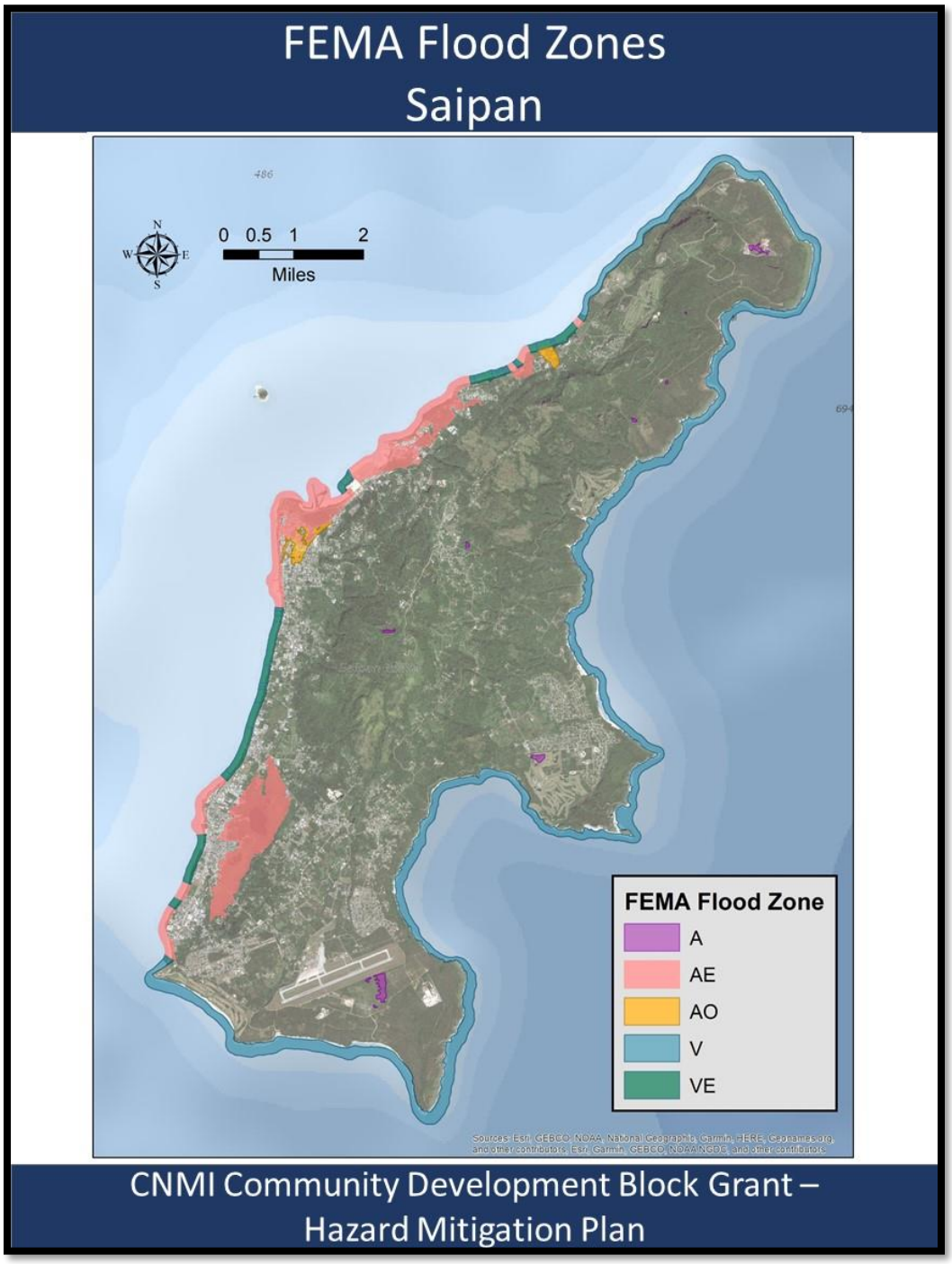
Under the National Flood Insurance Program (NFIP), FEMA is required to develop flood risk data for purposes of floodplain management. FEMA develops these data sets through the Flood Insurance Studies (FIS) program, where detailed and approximated values of flood risk are utilized in identifying vulnerable communities. Using the results derived from the FIS, FEMA outlines the potential threat areas through the documentation of a Flood Insurance Rate Map (FIRM) that depicts the flood areas within the studied community (Figures 21-23).

Flood zone designations in the maps below are described as:

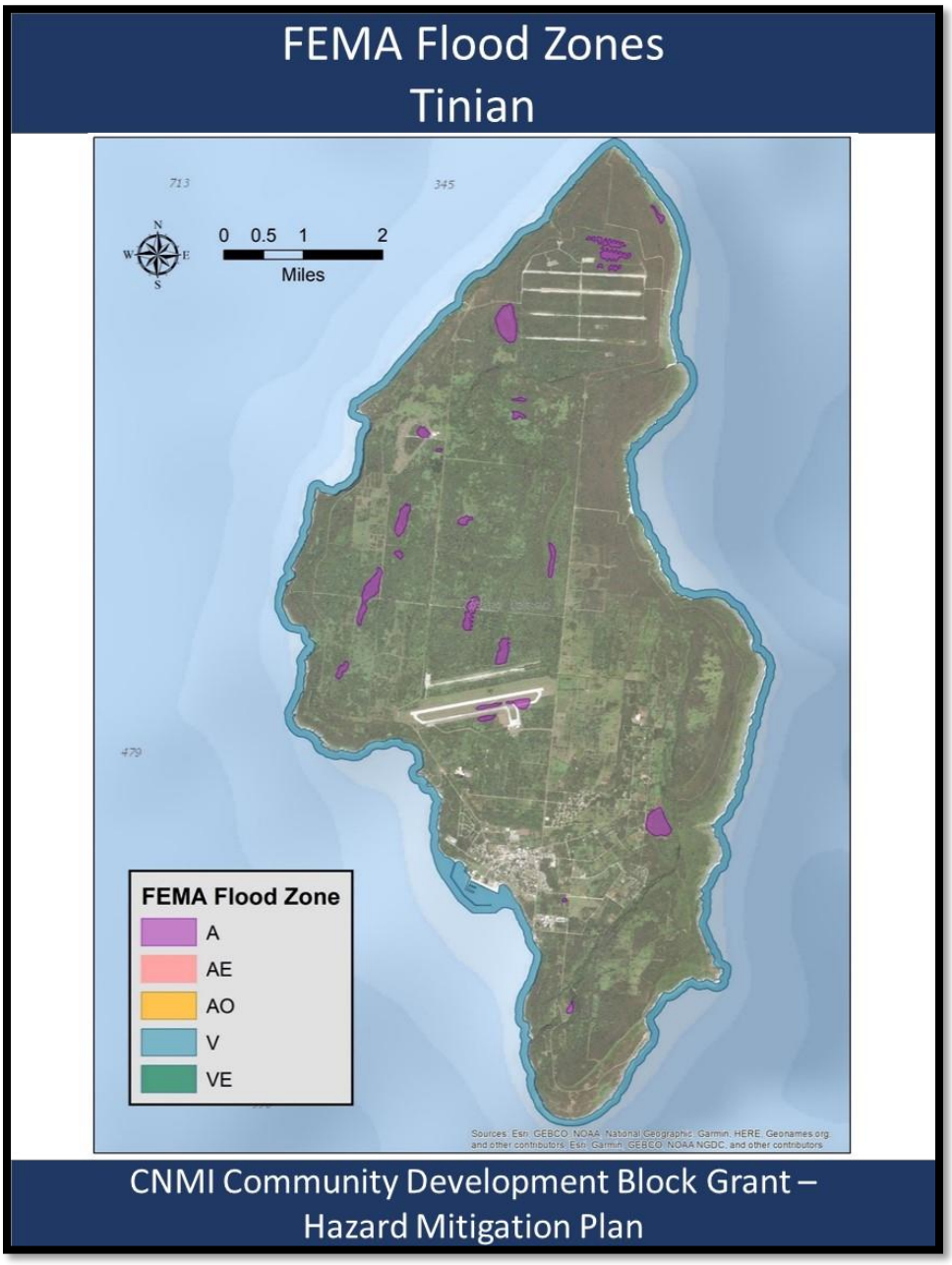
- **A**: Areas with a 1% annual chance of flooding and a 26% chance of flooding over the life of a 30-year lease. Because detailed analyses are not performed for such areas; no depths or base flood elevations are shown within these zones.
- **AE**: The base floodplain where base flood elevations are provided.
- **AO**: River or stream flood hazard areas, and areas with a 1% or greater chance of shallow flooding each year, usually in the form of sheet flow, with an average depth ranging from 1 to 3 feet. These areas have a 26% chance of flooding over the life of a 30-year lease.
- **V**: Coastal areas with a 1% or greater chance of flooding and an additional hazard associated with storm waves. These areas have a 26% chance of flooding over the life of a 30-year lease. No base flood elevations are shown within these zones.
- **VE**: Coastal areas with a 1% or greater chance of flooding and an additional hazard associated with storm waves. These areas have a 26% chance of flooding over the life of a 30-year lease. Base flood elevations derived from detailed analyses are shown at *selected intervals* within these zones

The flood zone maps and associated data in the figures below have not been updated since the CNMI's last FIS in 2005. Currently the CNMI is engaged with FEMA in the Risk Mapping, Assessment, and Planning Program (MAP), which will result in updated flood zones and associated flood hazard products for the Commonwealth.

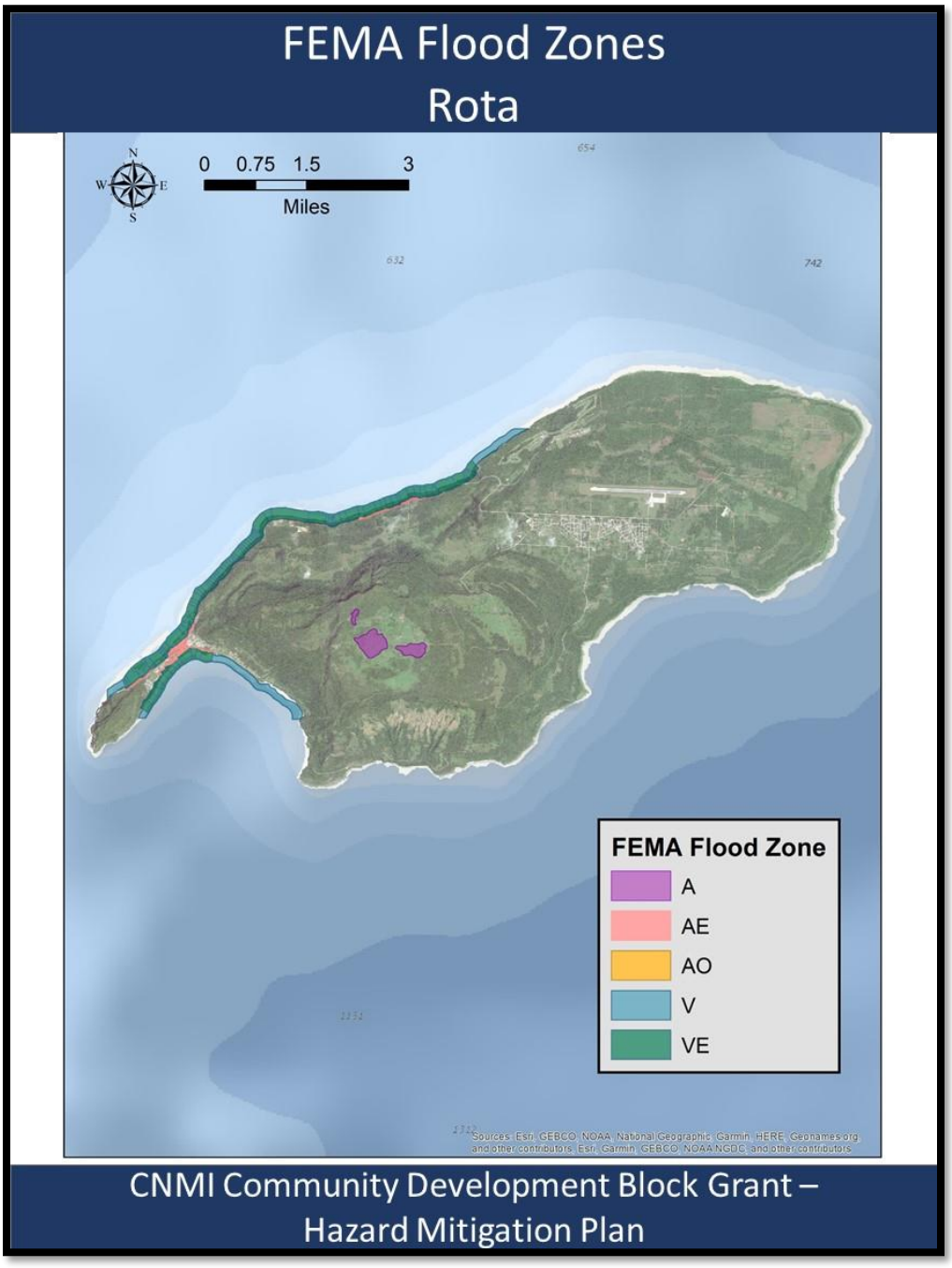
21: FEMA Flood Zones for Saipan



22: FEMA Flood Zones for Tinian



23: FEMA Flood Zones for Rota



Potential Impacts

Severe flood events in many communities throughout the U.S. often result in loss of life, as well as depriving survivors of their property, possessions and time. Floods can also generate health hazards from polluted waters and create physiological stress on populations contending with the outcomes of property damage or the loss of irreplaceable family valuables. Floods can cause severe damage to the economy. Buildings and inventories are physically damaged or destroyed by the onslaught of water. Income is lost as businesses are forced to close by floodwaters, or

lose customers who cannot get to the establishment. The loss of income can have a ripple effect on jobs and other related businesses. Flooding conditions can be a major problem for many struggling businesses and force them to close or relocate out of the area. Flooding of streets, highways and underpasses affects many more people than those who live in floodplains. Travelers, commuters, and commerce are affected. In addition, flooding of road networks can limit or block access to critical infrastructure, creating ancillary consequences for utilities and basic public services.

Areas not under direct flooding conditions can experience indirect impacts. When floods inundate a water or wastewater treatment plant, the entire community may lose its water supply or experience the failure of its sewer system. Overloaded sewers can flood streets and homes with sewage whereupon downstream communities could be subjected to inundation of polluted water.

Annual precipitation throughout the Northern Mariana Islands ranges from 80 to 90 inches a year depending on the location within the islands, but a significant portion of this annual rainfall comes in the form of more extreme precipitation events associated with storms and monsoon activity during the wet summer months. Although the geological composition of the islands allows for adequate infiltration rates in most areas, extreme precipitation rates in isolated events can exceed the infiltration rates of soils and underlying geology, leading to sheet flow, run-off, and flash flooding. Identified low-lying areas with poor drainage or those prone to storm surge have a moderate potential to be impacted by flooding conditions, while the continued development of urbanized centers, impervious surfaces, and growth without proper drainage or erosion control measures can contribute to the damaging impacts of floods. Figure 24 illustrates the 2018 SSMP scheme for categorizing the intensity of flooding hazards in CNMI.

24: SSMP Hazard Intensity Rating Definitions for Flooding

Hazard	Low	Moderate	High
Flooding	No history of coastal or inland flooding and no reasonable basis for expected flooding due to low seasonal rainfall in watershed. Areas within designated Zone X-other areas.	History of non-damaging flooding where streams or highlands with seasonal high rainfall are present. Areas within designated Zone X-other flood areas.	Historically high flood damage on gentle slopes. Areas within 100-year flood designated Zones A, AE, AH, AO, A99, V, and VE and floodway areas in Zone AE. Zone V Flood Areas with base flood elevation of 7 feet.

Flood hazard exposure and risk is analyzed in greater detail in Section 3 of the Action Plan through use of a composite flood hazard and threat index. The index, built on the methodology described in Dobson et. al 2020b, provides an important baseline for establishing priority mitigation areas for project implementation.

Earthquake

The Mariana Islands are situated in a tectonically active region characterized by the northwestward subduction and under thrusting of the Pacific Plate beneath the Mariana plate

along the Mariana Trench at a rate of 6.3 centimeters per year (Mueller et. al 2012), and the eastward spreading of oceanic crust from the Mariana Trough. Seismic hazards are those related to ground shaking. Landslides, ground cracks, rockfalls, and subsequent tsunamis are all results of seismic activity. Hazard definitions for earthquakes are generally related to impacts (damages to structures and their contents), and more directly through measurements of magnitude and intensity.

Engineers, seismologists, architects, and planners have carefully evaluated seismic hazards related to building construction, devising a system of classifying seismic hazards on the basis of the expected strength of ground shaking and the probability of the shaking actually occurring within a specified time. The results are included in the International Building Code (IBC) seismic provisions. The IBC contains six seismic zones, ranging from zone 0 (no chance of severe ground shaking) to zone 4 (10% chance of severe shaking in a 50-year interval). The shaking is quantified in terms of g-force, the earth's gravitational acceleration.

According to the U.S. Geological Survey, one problem in assigning seismic hazard zones within the CNMI is that the ground shaking during a strong earthquake may vary within a small area. This variation is due to the nature of the underlying ground; for example, whether it is mainly lava bedrock or soil. Two homes in the same neighborhood may suffer different degrees of damage depending on the properties of the ground upon which they are built. In addition, local topography strongly affects earthquake hazards. Steep slopes composed of loose material may produce large landslides during an earthquake. The risk from living in a seismically active area, unlike that of depends to a large degree on the type of construction used in a given home. Earthquake shaking may damage certain types of houses, while leaving other types of construction unscathed. For all of these reasons, earthquake hazards are highly localized and dependent on the appropriate growth of the built environment, and it is therefore difficult to define broad zones with the same relative degree of hazard.

Previous History

Destructive earthquakes have struck the Mariana Islands in 1825 (Modified Mercalli Intensity VIII), 1834 (VIII), 1849 (IX), 1862 (VII), 1892 (VIII), 1902 (IX), 1903 (VII), 1909 (VIII), 1936 (VIII), 1970 (V), 1975 (VII), 1978 (VII), and 1993 (IX), but only the most recent large events have been well recorded and studied (Mueller et. al 2012).

On 05 April 1990, a magnitude 7.4 earthquake occurred just east of the Mariana trench near 15.2°N and 147.6°E. The event was not destructive, but was the largest *shallow* earthquake ever recorded in the region.

On 08 August 1993, a magnitude 7.8 earthquake occurred about 60 km south-southeast of Agana, Guam, near 13.0°N and 144.8°E at a depth of 60–70 km. This was the largest earthquake ever fully recorded in the Marianas, and caused considerable damage on Guam. The event was characterized as a shallow thrust, and is likely to be consistent in terms of seismic action to other large earthquakes experienced in the future in the Marianas (Mueller et al. 2012).

The United States Geological Survey has cataloged 5086 earthquakes over magnitude 4.5 within 200 miles of Saipan and Tinian from 1932-2021 (USGS 2021). A subset of the stronger events (magnitude 6.0+) within 100 miles of the CDBG-MIT MID Areas is listed in Figure 25.

25: Significant Earthquakes (Magnitude 6+) within 100 miles of CDBG-MIT MID Area

Earthquakes within 100 miles of CNMI Southern Islands (1932-2021) (Magnitude 6.0 and above)			
Date & Time	**Depth (km)**	**Magnitude**	**Location**
2018-08-28T22:35:13.410Z	55	6.4	211 km NNE of Saipan, Northern Mariana Islands
2018-02-11T23:14:15.080Z	10	6	154 km SE of San Jose Village, Northern Mariana Islands
2014-09-17T06:14:45.410Z	130	6.7	43 km NW of Piti Village, Guam
2008-05-09T21:51:29.730Z	76	6.8	181 km WSW of Merizo Village, Guam
2005-02-05T03:34:25.730Z	142.7	6.6	89 km N of Saipan, Northern Mariana Islands
2005-02-02T02:30:25.940Z	158.7	6.3	63 km NNW of Yigo Village, Guam
2004-11-03T08:31:43.730Z	10	6	142 km ESE of San Jose Village, Northern Mariana Islands
2004-10-04T19:20:34.980Z	7.2	6	152 km ESE of Saipan, Northern Mariana Islands
2002-08-14T13:57:52.110Z	30	6.5	114 km SSE of San Jose Village, Northern Mariana Islands
2002-04-26T16:06:07.000Z	85.7	7.1	20 km SSW of Merizo Village, Guam
2001-10-12T15:02:16.840Z	37	7	69 km SSE of Inarajan Village, Guam
2000-05-02T15:03:36.800Z	55	6	Mariana Islands region
2000-02-26T08:11:48.440Z	132.2	6.2	30 km NNW of Yigo Village, Guam
1999-12-19T00:48:36.990Z	50.9	6	45 km SSW of Merizo Village, Guam
1998-08-30T01:48:08.760Z	33	6.3	Mariana Islands region

1998-05-15T05:58:06.040Z	154.1	6	71 km N of Yigo Village, Guam
1997-05-09T09:06:37.270Z	29	6	8 km SSE of Merizo Village, Guam
1997-04-23T19:44:28.420Z	100.8	6.5	49 km N of Yigo Village, Guam
1996-06-09T01:12:16.760Z	149	6.5	248 km N of Saipan, Northern Mariana Islands
1993-08-16T04:33:48.440Z	18.3	6	41 km SE of Inarajan Village, Guam
1993-08-11T14:17:37.720Z	21.6	6.2	91 km ESE of Yigo Village, Guam
1993-08-08T08:34:24.930Z	**59.3**	**7.8**	**32 km S of Inarajan Village, Guam**
1993-06-06T13:23:20.860Z	13.5	6.5	112 km NE of Saipan, Northern Mariana Islands
1991-02-10T14:15:19.850Z	155.7	6	54 km NNW of Yigo Village, Guam
1990-04-06T14:57:20.100Z	15.5	6.3	197 km E of Saipan, Northern Mariana Islands
1990-04-05T21:12:35.550Z	11.4	7.6	198 km E of Saipan, Northern Mariana Islands
1989-12-23T11:24:02.680Z	161.5	6.3	242 km N of Saipan, Northern Mariana Islands
1985-05-31T07:24:34.120Z	31.9	6	120 km SSW of Merizo Village, Guam
1984-09-22T18:10:35.540Z	98	6.1	61 km ENE of Yigo Village, Guam
1975-11-01T01:17:33.900Z	113	6.1	36 km NNW of Yigo Village, Guam
1970-09-16T01:49:21.000Z	45	6	21 km SW of Merizo Village, Guam
1970-03-04T03:30:35.000Z	20	6.2	146 km SW of Merizo Village, Guam
1966-05-20T09:14:45.000Z	25	6.1	150 km SE of San Jose Village, Northern Mariana Islands
1959-01-13T01:15:30.000Z	15	6	134 km E of Yigo Village, Guam
1951-11-13T07:57:40.000Z	15	6	123 km SE of San Jose Village, Northern Mariana Islands
1949-07-02T19:57:14.000Z	15	7.1	236 km NE of Saipan, Northern Mariana Islands
1942-06-14T03:09:53.000Z	15	7	231 km ESE of Saipan, Northern Mariana Islands
1940-01-17T01:14:56.000Z	15	7.5	Mariana Islands region

1936-10-29T18:39:02.000Z	75	6.5	52 km ENE of Yigo Village, Guam
1932-03-19T10:59:41.000Z	15	6.4	216 km ENE of Saipan, Northern Mariana Islands

The seismic hazard ratings utilized in the CNMI's State Mitigation planning process are described below in Figure 26. Due to a history of relatively minor impacts for seismic activity in the CNMI, earthquake hazards were not analyzed as part of the mitigation area prioritization work detailed in Section 3 of this Action Plan.

26: Hazard Intensity Rating Definitions for Seismic Activity

Hazard	Low	Medium	High
Seismicity - Earthquakes	No seismic activity in recent recorded history	Areas of limited history of seismic activity with minor historic seismic damage	History of frequent seismic activity with major historic seismic damage. Areas with soils subject to liquefaction or with unconsolidated fill. High population density areas along identified fault lines.

Volcanic Eruption

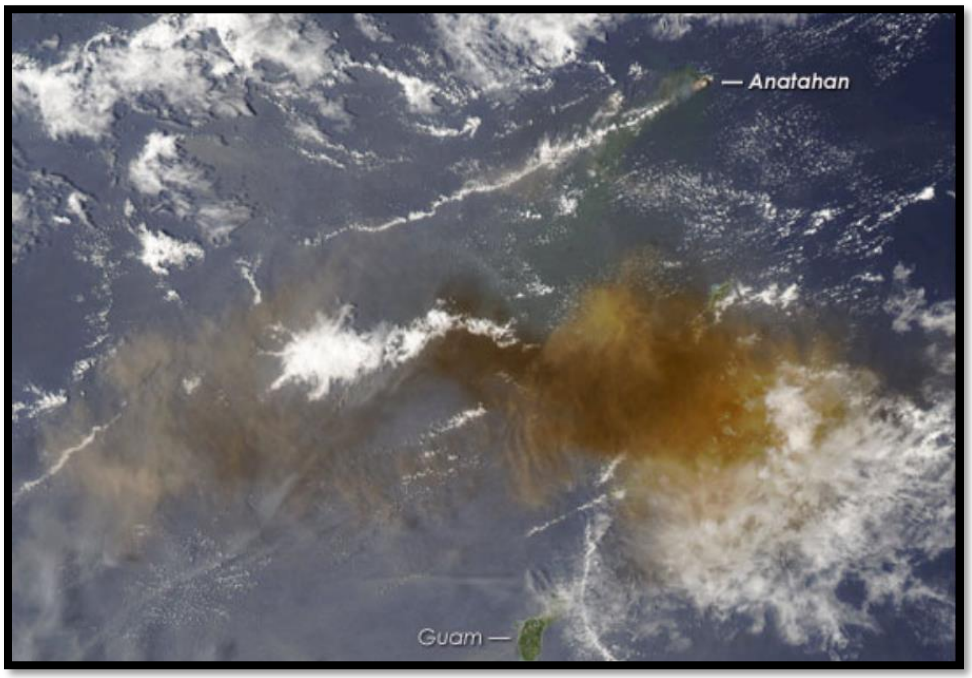
Volcanic activity is one of the most perceptible signals of the earth's basic thermal and kinetic instability. All the Mariana Islands lie along the Mariana Ridge, which with the collective of islands, seamounts, the Mariana Trench to the east and the Mariana Trough to the west, are referred to as the Mariana Island Arc System. For the Mariana Island Arc System, volcanism is concentrated along the Mariana Ridge, a submerged topographic high on the sea floor, situated 50 to 100 kilometers west of the Mariana Trench and the Mariana Island Arc System.

The Mariana Island Arc System is divided into two distinct geological histories. The six islands south of Anatahan, including the island of Guam, are extinct volcanic edifices that during their long and episodic upward growth have acquired a veneer of limestone, which is a rock comprised of cemented skeletal remains of coral and calcareous marine organisms that consist mostly of calcium carbonate. The emerging volcanic structures acquired this sheath of limestone by remaining submerged in shallow marine waters as the organisms have accumulated over a vast span of time.

Anatahan and islands north of it are far more active volcanically, with Anatahan and Pagan posing the most immediate threats to communities in the CNMI. These islands, stretching from Anatahan to Farallon de Pajaros, are all stratovolcanoes (volcanoes composed of both lava

flows and volatile pyroclastic material) that result from the re-melting of subducted material. Activity associated with stratovolcanoes globally has involved the most violent and explosive types of eruptions throughout history.

With regard to the CDBG-MIT MID Areas, the most relevant volcanic hazard is Anatahan, which erupted in 2003 and 2005. During the April 2005 eruption massive plumes of ash were transported south, partially settling over Saipan and Tinian. The sky over the islands became dark late on April 5 soon after the eruption, and nearly 12 hours later the islands were still completely obscured by a brown cloud of ash. Although there were no injuries reported or major structural damage, impacts persisted in the form of disruptions to transportation infrastructure (closure of airports), hazardous air quality, and impairment of water distribution systems. Residents of Saipan and Tinian were warned to remain indoors during the ash fall, and avoid drinking ash-contaminated water that resulted from material settling in surface water storage and infiltrating groundwater. NASA's Aqua satellite captured the following image of the brown ash plume covering Saipan and Tinian on April 5, 2005.



Source: NASA Moderate Resolution Imaging Spectroradiometer (MODIS) Satellite System | NASA Earth Observatory (https://earthobservatory.nasa.gov/images/14469/eruption-of-anatahan)

Potential Impacts

Volcanic eruptions can cause catastrophic damage in a variety of ways, particularly with the emission of ash and sulfur gases. Most of the active volcanoes within the CNMI exist on distant and remote islands to the north but normal trade wind patterns could pose a threat to the southern islands with transported ash fall, as was experienced in 2005. Volcanic emissions and ash pose a threat not only to young, asthmatic and elderly people, but may also disrupt air transportation in the CNMI, and compromise freshwater supplies.

In the event of an eruption on Pagan, volcanic activity can pose an immediate threat to life and property for small, remote populations north of Saipan. Pagan's eruption in 1981 forced the

evacuation and long-term relocation of the island's entire population at the time. This community has yet to be fully re-settled.

Figure 27 provides the criteria used in the 2018 SSMP to define hazard intensity for volcanic activity.

27: Hazard Intensity Rating Definitions and Volcanic Activity

Hazard	Low	Moderate	High
Volcanism	No history of volcanic activity in recent recorded history	Areas of limited history of volcanic activity	Areas of frequent volcanic activity

Tsunami

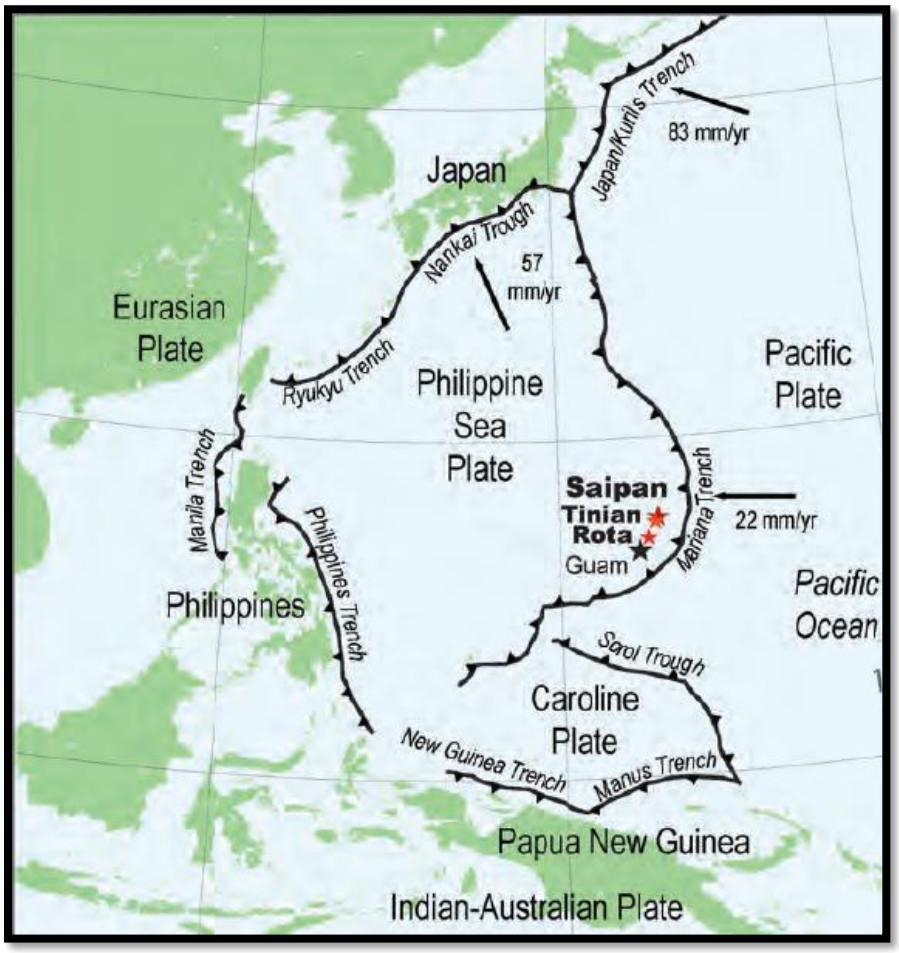
Tsunamis are powerful oceanic waves resulting from enormous amounts of displaced water following explosions, earthquakes, landslides, and volcanic eruptions. Tsunamis can have wavelengths of up to 500 km (310.69 mi), and can move as fast as 640 km/hour (397.68 mi/hr), reaching locations far from an earthquake epicenter or point of disturbance in a very short amount of time. The cumulative volume and energy of these waves can cause catastrophic destruction to both the built and natural environment, particularly in low-lying coastal areas. As a tsunami propagates into shallower coastal waters its characteristics and potential impact are further shaped by coastal shoreline configuration and near-shore bathymetry. The presence or absence of features such as bays, estuaries, lagoons, reefs, and continental shelf can make a substantial difference in tsunami behavior and associated risk.

While all low-lying coastal communities in the Pacific Islands Region are potentially exposed to the threat of tsunamis, those islands that have well-formed barrier reefs are afforded some protective capacity as reef systems serve as natural coastal defense infrastructure. Numerical modeling of tsunami sensitivity, propagation, and impacts in the CNMI have suggested that Saipan's lagoon and western barrier reef provide significant protection and attenuation of tsunami waves, while the smaller fringing reefs around Rota and Tinian provide less protection (Uslu et al. 2013). This is a particularly important factor in assessing tsunami risk and mitigation planning, as the most vulnerable populations and concentrations of infrastructure in the CNMI are located within potential inundation zones adjacent to the Saipan Lagoon.

Past History and Local Context

The CNMI is situated in an exposed location within the Western North Pacific basin, and is surrounded by subduction zones on all sides. This means planning for tsunami risk and mitigation requires consideration of many potential source regions. Figure 28 illustrates the regional setting and relevant subduction zones where a tsunami hazard to the CNMI would most likely originate (*figure source:* Uslu et al. 2013).

28: Major Subduction Zones Posing Tsunami Hazards to the CNMI



To the east, the Mariana Trench is formed by the Pacific Plate moving westward and colliding with the Philippines Sea Plate at a rate of approximately 22 mm. per year. The Mariana Trench extends northward to connect with the Nankai and Japan/Kuril trenches, which are characterized by the highest stress accumulations in the region, with plate movement at 83 mm. per year (Stein and Okal 2007). The Nankai Trench extends south, with a movement rate of 57 mm. per year, and nearly connects with the Manila Trench between Taiwan and the Philippines. The Philippines Trench to the east and New Guinea and Manus trenches to the south complete a circle of subduction zones and potential tsunami sources surrounding the Marianas.

The 2011 Tohoku tsunami that caused devastation in Japan originated with a >9.0 earthquake within this envelope of subduction zones, specifically near the junction of the Mariana, Nankai, and Japan/Kuril trenches. The Tohoku tsunami reached the Northern Marianas in less than 3.5 hours, caused minor flooding on Saipan, and created surges in Apra Harbor that damaged U.S. Navy vessels. The tsunami wave height was observed to be 130 cm at the Saipan Harbor tide gauge and 50 cm at the Pago Bay tide gauge on Guam (Uslu et al. 2010).

Tsunami catalogs list five tsunamis that were observed and recorded in various forms in the Mariana Islands prior to the 2011 Tohoku event. These tsunamis occurred in the years 1837, 1849, 1892, 1990, and 1993. The source of the 1837 tsunami event remains unknown, but the

1849, 1892, 1990, and 1993 tsunamis were each generated by near-source earthquakes within the Mariana Islands. The 1849 tsunami is believed to be the only one of these tsunamis to have caused a fatality in the region (Uslu et al. 2010). The 1892 tsunami was notable for the observed withdrawal of water and sea level around Guam, particularly in Agana Harbor. The 1990 tsunami was reported and confirmed by eyewitnesses, but no quantifiable measurements were made. The 1993 tsunami was recorded as a contemporary event via tide gauges on Guam; however, impacts from the 1993 earthquake and seismic shaking itself on Guam were far more tangible than the consequent tsunami.

While the CNMI benefits from a number of physical attributes that lower tsunami risk, including protective reefs, "shadowing" effects of other islands, and an absence of shallow coastal shelf environments and bays, the history of observed tsunamis and potential for extreme seismic events along adjacent subduction zones remain. The potential worst-case scenarios and associated impacts therefore warrant thorough consideration in the context of mitigation planning.

Potential Impacts

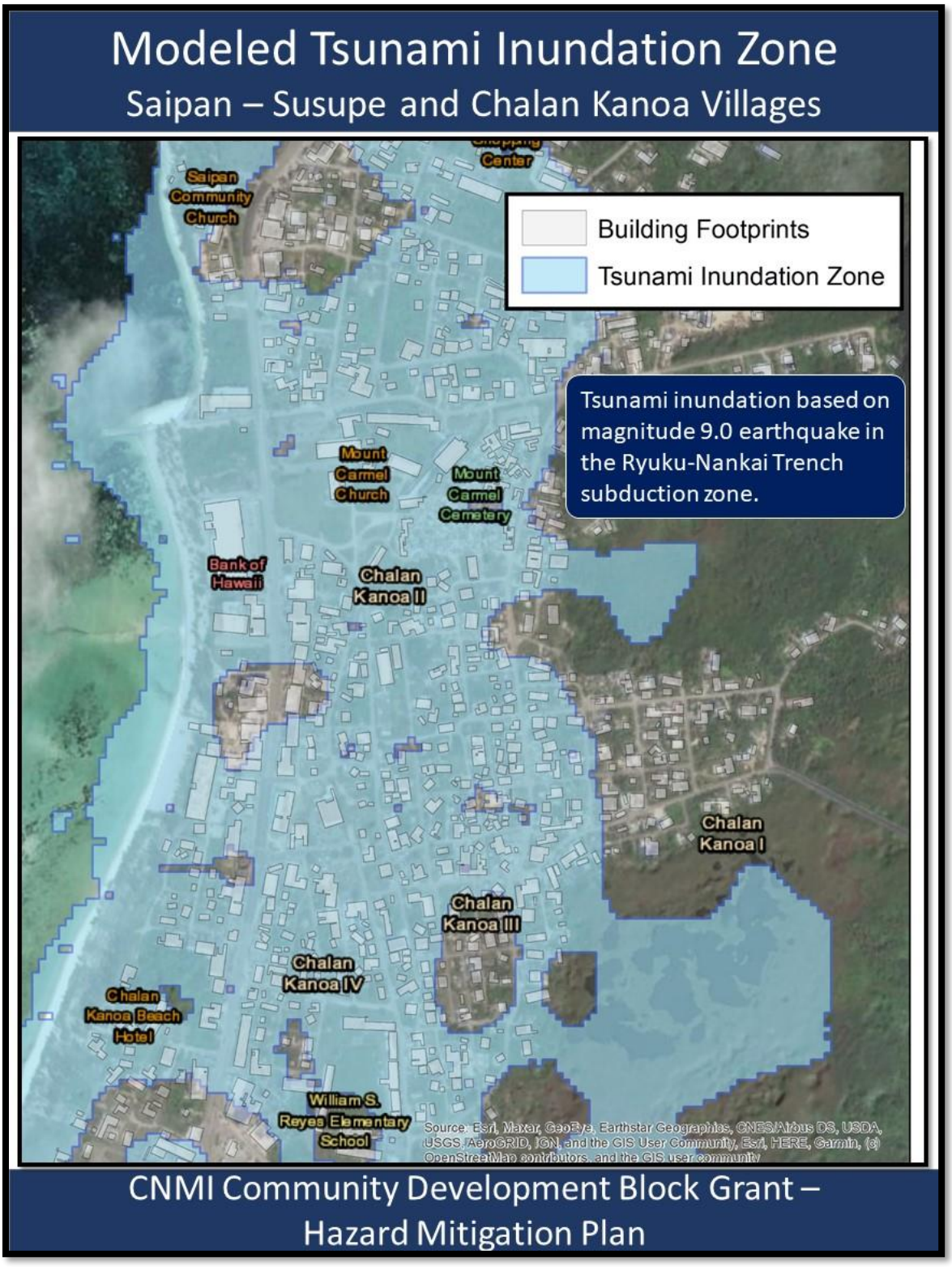
In 2012 and 2013 a comprehensive tsunami hazard assessment was conducted for Saipan, Tinian, and Rota to identify relative vulnerabilities to large tsunami events. A sensitivity study was conducted using the NOAA Tsunami Forecast Propagation Database to model tsunami impact along the coastlines of Saipan, Tinian, and Rota from tsunamis originating from 349 discrete earthquake sources. Results show that a total of 26 potential earthquake scenarios (5 from Western Aleutian sources, 3 from Cascadia, 2 from the Philippines, 2 from Japan, 4 from the Marianas, 2 from Manus Trench, 2 from New Guinea, and 6 from the Ryukyu-Nankai Trench) pose a tsunami hazard to the CNMI.

The study predicted that a magnitude 9.0 earthquake originating from a source south of Japan (Ryuku-Nankai Zone) could result in wave amplitudes exceeding 11 meters in Saipan, and a magnitude 9.0 earthquake occurring in the East Philippines could trigger tsunami wave amplitudes exceeding 3 meters on Rota and 4 meters on Saipan and Tinian.

Closer sources within the Marianas, primarily along the Mariana Trench subduction zone pose an even greater hazard. Predicted wave amplitudes at Saipan and Tinian would exceed 13 meters and would be greater than over 7 meters along the Rota coastline should a magnitude 9.0 earthquake occur in this area.

Study results for the most extreme tsunami scenarios on Saipan were provided to the CNMI Government in 2013 in the form of digital spatial data, allowing for further assessment of local hazard exposure and risk. The gridded data included inundation extent, overland flow depth, current speed, and wave amplitude output from the NOAA propagation database and Method of Splitting Tsunamis (MOST) model. Figure 29 highlights the potential tsunami inundation extent in the villages of Susupe and Chalan Kanoa on Saipan following a magnitude 9.0 earthquake in the Ryuku-Nankai subduction zone. Based on building and population density and presence of significant sewer and stormwater infrastructure, utilities, and a major transportation artery (Beach Road), this area of Saipan faces the greatest risk with respect to tsunami hazards.

29: Tsunami Inundation Zone for Susupe and Chalan Kanoa Villages



Although historic impacts from tsunamis have been minimal in the Marianas, the potential inundation extents for the most extreme scenarios encompass densely populated areas with

critical infrastructure, particularly on the west coast of Saipan, Tinian Harbor, and Song-Song Village on Rota. These areas are also the most prone to coastal flooding in general, therefore prioritization of hazard mitigation for infrastructure based on a flood hazard index (Section 3) accounts for resources and populations exposed to tsunami hazards as well.

Within the CNMI's State Mitigation Plan tsunami hazard zones are simplified based on a very conservative elevation contour, accommodating any error or potential underestimates of inundation extent. Figure 30 illustrates the 2018 SSMP criteria for defining hazard intensities for tsunamis in the CNMI.

30: Hazard Intensity Rating Definitions for Tsunami Inundation

Hazard	Low	Medium	High
Tsunami Inundation	Coastal areas above 10-meter inundation line.	Coastal areas along the fringe of 10-meter inundation line.	Coastal areas below 10-meter inundation line and along the shore.

Alternative funding sources have been identified by the CNMI HSEM to complete updates to tsunami evacuation zones, routing, and assembly planning for Saipan, Tinian, and Rota, therefore those mitigation planning activities are not prioritized for CDBG-MIT funds.

Wildfire

Wildfires are common during the dry season throughout the CNMI, particularly during the tail end of El Nino episodes from January into April, when drought conditions can persist for weeks. These fires threaten populated areas and at-risk environments, particularly the areas of Wireless Ridge and grasslands surrounding Mt. Tapochau on Saipan. The Talakhaya Watershed and re-vegetation area on Rota, a long-term focus for watershed restoration in CNMI, is also highly vulnerable to fires. The entire CNMI is especially susceptible to wildfires during spells of combined drought and high winds.

Between 2015 and 2017, 120 events were categorized as wildland/brush fires. These events (along with more recent fires through 2019), and their associated spatial data showing wildfire coverage, were used in a modeling exercise to map wildfire probability of occurrence (CNMI BECQ 2020).

Historic fire boundaries were mapped by Fire Specialists at the University of Hawaii using worldview satellite imagery. Their data includes fire coverage throughout the island of Saipan for the years of 2016-2019.

Environmental variables of landcover, elevation, slope, aspect, temperature, and population were used as predictor variables for presence or absence of fire. Gridded map data for these predictors was then compared with the historic fire boundaries in order to train and validate the wildfire probability model. The results of this work generated a spatial dataset with "probability of occurrence" values ranging from 0% to 100%.

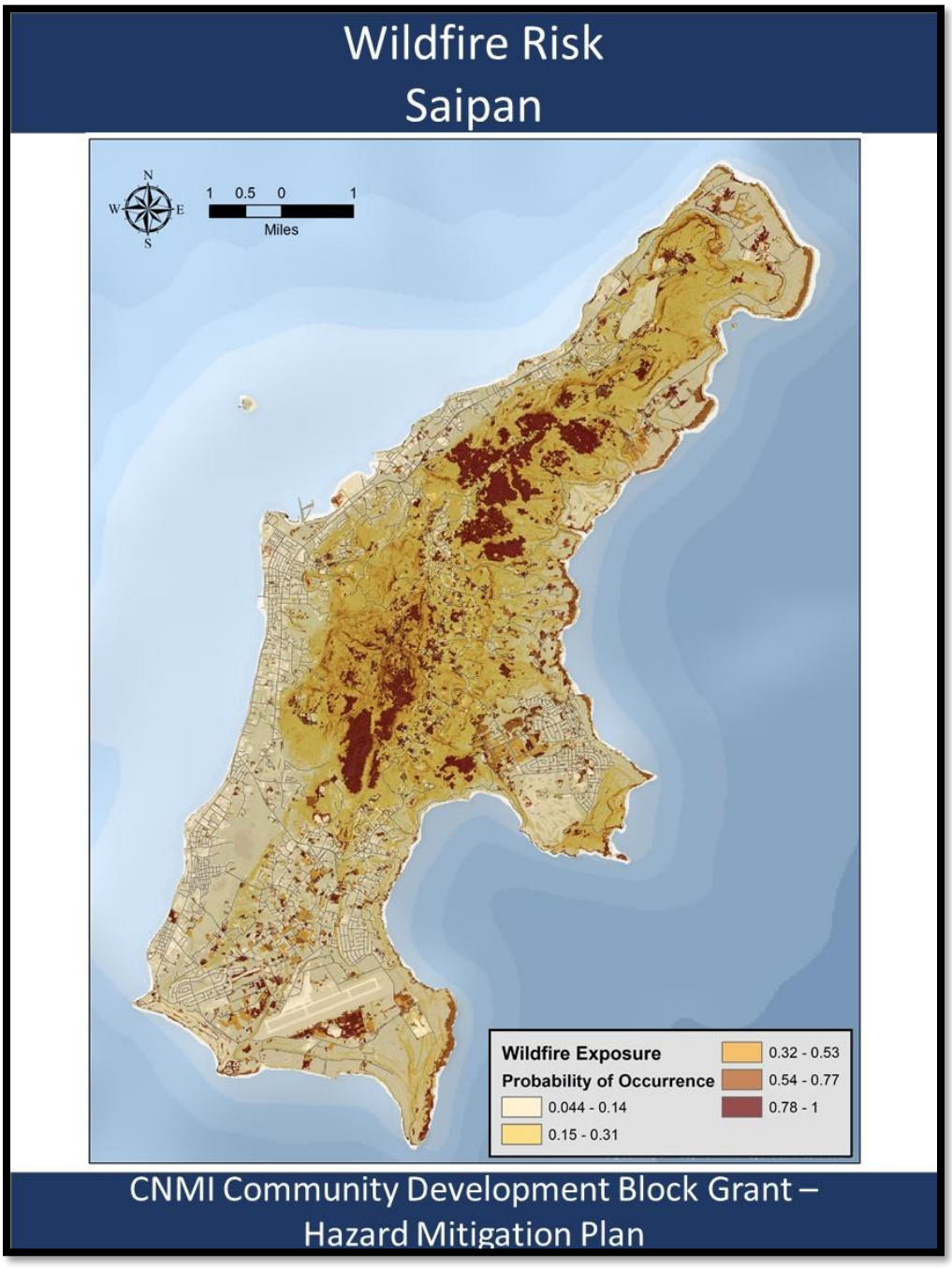
In the map figures on the following pages (Figures 31-34) the values 0.0-0.99 can be interpreted as the percentage similarity of an area's environmental characteristics to the frequency with which the area has burned.

Comparing the areas with a high fire vulnerability (75% similarity or greater) to the FEMA Hazus building inventory for the CNMI allows for estimates of both structural values and building contents values that could be at higher risk to wildfire. Overlaying the structure inventory for CNMI with areas that are highly susceptible to fire yields a total of $26.3 million in structural value at risk, and $14.7 million in building content value at risk.

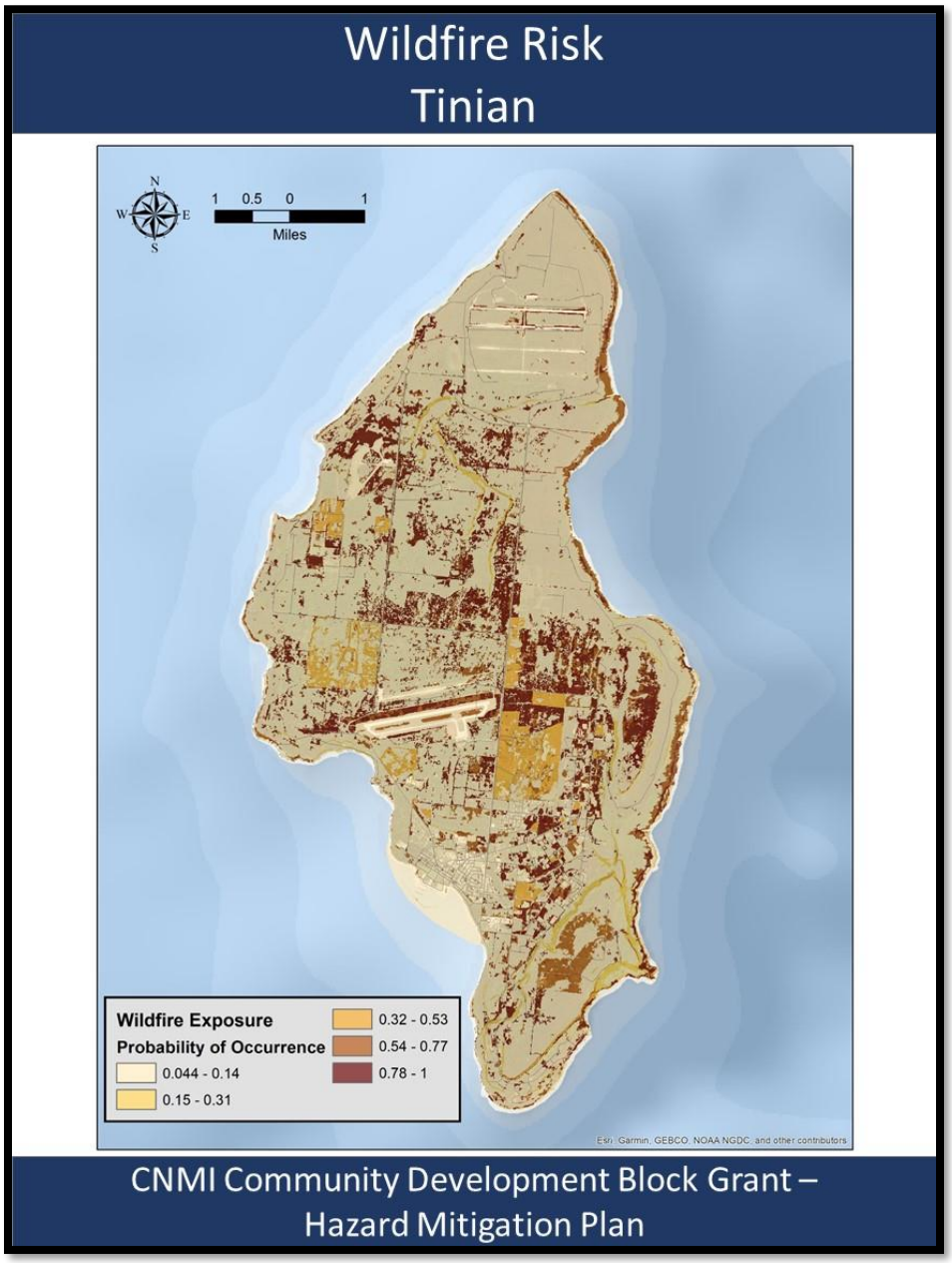
Fortunately, the seasonal wildfire events in CNMI have seen effective response efforts from the CNMI Department of Fire and Emergency Medical Services (DFEMS), particularly in instances where rapidly spreading fires in upland grasslands threaten to migrate into residential areas. Due to the ability of emergency response efforts and strategies to satisfy wildfire mitigation needs, this hazard was not emphasized in further CDBG-MIT project and strategy development.

31: Wildfire in the Talofofo Watershed, Saipan (1/21/2021)

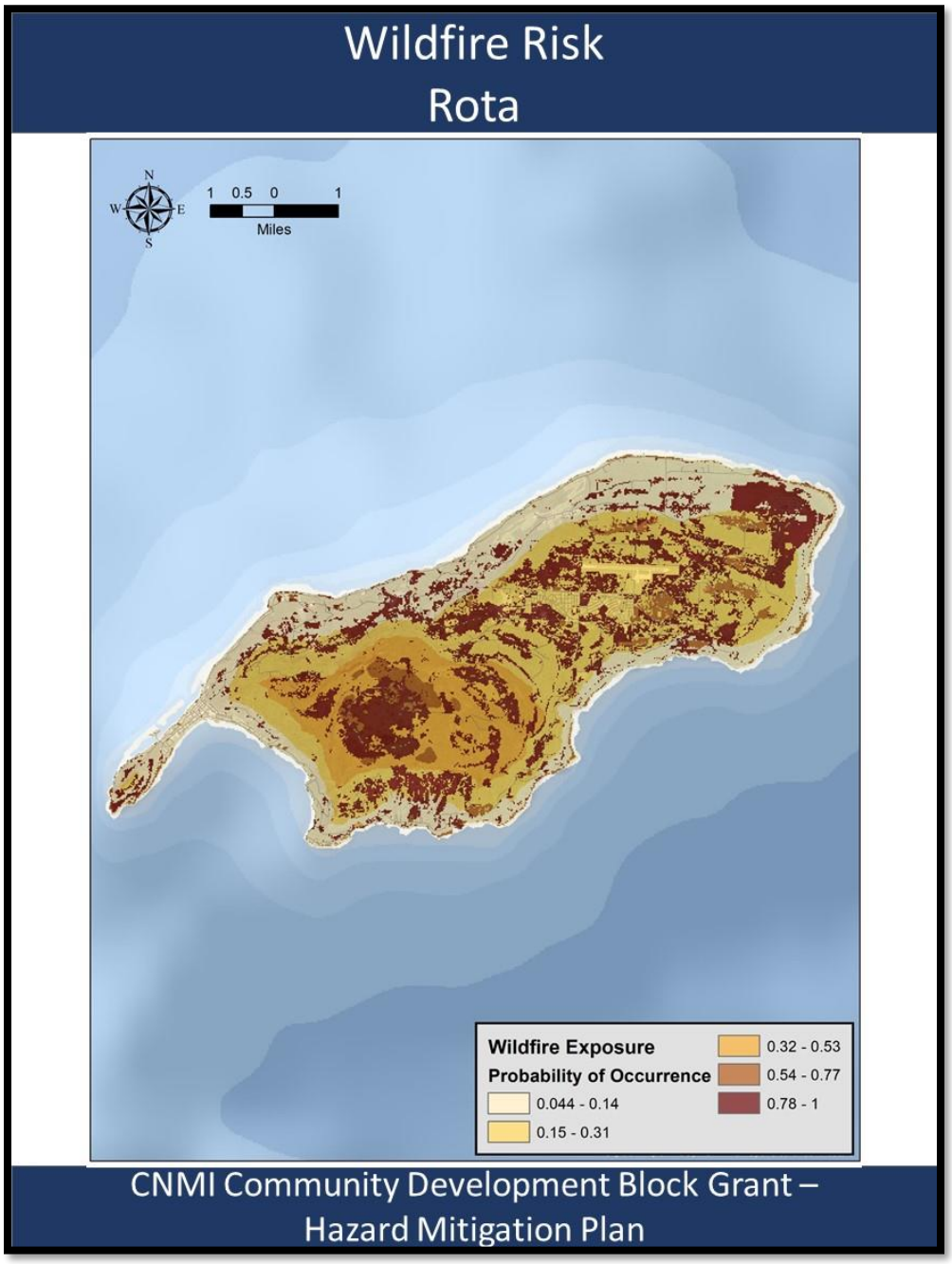
32: Map of Wildfire Chance of Occurrence – Saipan



33: Map of Wildfire Chance of Occurrence – Tinian



34: Map of Wildfire Chance of Occurrence – Rota



Climate Stressors

While the primary hazards impacting the CNMI have been discussed in detail within this action plan, and in related mitigation and disaster recovery documents for the Northern Marianas, there is also a need to consider potential changes in future hazard intensities, frequencies, and impacts due to a changing climate. Long-term shifts in air temperature, rainfall, sea levels, ocean chemistry (temperature and acidity), and storm patterns may increase or reduce current

levels of hazard risk. Tropical cyclones as a stand-alone hazard provide an excellent example of this, as climate change may lead to more intense, but less frequent typhoons.

Shifting Storm Patterns

The number of named tropical storms and typhoons passing through the Marianas has remained consistent on average over the long-term record (Lander 2004, Marra and Kruk 2017). Historically the CNMI and Guam could expect between two to eight storms in any given year on average. In the broader Western North Pacific basin, the overall frequency of tropical cyclones decreased 15% from 1980 to 2013 (Lin and Chan 2015), while storm tracks generally shifted northward. This created a scenario in which tropical cyclone exposure decreased in the Marianas region from 1992–2013 compared to previous decades (Lin and Chan 2015). Compared to this trend, the direct impacts from typhoons Soudelor, Mangkhut, and Yutu seem somewhat anomalous, and demonstrate the stochastic nature of these storms.

There is consensus among the scientific community that tropical cyclone intensity is likely to increase in a warmer climate, including storms in Micronesia and the Marianas (USGCRP 2017; Widlansky et al. 2019; Kossin et al. 2020). The increase in storm intensity is projected to occur in stronger storms the most, which will result in increased maximum intensities. This translates into an amplification of severe damage potential in the Marianas (Widlansky et al. 2019).

Fewer tropical cyclones are projected to occur by the end of this century, both globally and around the CNMI (USGCRP 2017). The overall decrease in the number of tropical cyclones annually is generally expected because climate models suggest that the atmosphere will become more stable with continued greenhouse warming (USGCRP 2017; Widlansky et al. 2019). Compared to the historical two to eight tropical cyclones yearly tracking through the Marianas, in the future, the occurrence is likely to decrease to one to six storms per year (Widlansky et al. 2019). Thus, mitigation planning in the Northern Mariana Islands should reflect expectations of fewer but stronger storms in the future.

Precipitation Change and Drought

Global and regional climate model outputs for the Mariana Islands show a wide range of possible future precipitation changes, from as much as 7% lower to as much as 20% higher in the CNMI overall in the long term (Grecni et. al 2021). The low confidence in future rainfall scenarios is partially a product of the uncertain relationship between a changing climate and inter-annual to multi-year climate cycles in the tropical Pacific (e.g. El Nino/La Nina). These cyclical phenomena have a strong influence on annual precipitation, as does the presence or absence of tropical cyclone activity in any given year.

Regardless, shifts in precipitation can contribute to hazards associated with both drought and flash flooding. Future scenarios that have been studied are characterized by great variability from year to year, meaning that projections for more frequent and intense extreme rainfall (Zhang et al. 2016), as well as an increase in drought conditions (Gingerich et al. 2019) are not mutually exclusive. Both warrant consideration in mitigation planning for water resources in the CNMI, particularly with respect to freshwater capture and storage and compatible actions to reduce stormwater runoff and associated flooding.

Although risk and impacts of drought are not analyzed specifically further in this Action Plan, flooding from extreme precipitation events is addressed within the composite flood index,

highlighted in Section 3. Furthermore, the potential for mitigation actions to reduce impacts to freshwater storage and distribution infrastructure means that any mitigation projects that enhance freshwater infrastructure will not only address hazards posed by tropical cyclones, but also increase resiliency in the face of uncertain rainfall projections.

Sea Level Rise

Compared with future rainfall projections, changing sea levels and long-term trajectories for global and CNMI-specific sea level rise have been examined with far more confidence. Local efforts to analyze sea level rise hazards and begin planning for adaptation have included future scenarios that consider long-term sea level curves under a range of greenhouse gas emissions (Sweet et al. 2017; U.S. Army Corps of Engineers 2021), temporary seasonal extremes (Chowdhury et al. 2010), total water level rise due to storm conditions (Chou 1989), and various combinations of these influences (Greene and Skeele 2014; Nimbus Env. 2018).

From 2017-2018 the CNMI Bureau of Environmental and Coastal Quality, Office of Planning and Development, Department of Public Works, NOAA, and Office of the Governor convened discussions around adopting a standard sea level rise and coastal flood scenario for mitigation and adaptation planning in the Commonwealth. The ad-hoc sea level planning committee considered scenarios in which gradual sea level rise due to climate change exacerbates temporary extreme sea levels due to 100-year seasonal maximums and passage of tropical cyclones. The scenarios discussed in these planning sessions are described in Figure 35, as well as the CNMI's Smart, Safe Growth Guidance Manual.

35: Sea Level Change and Coastal Flood Scenarios for Saipan

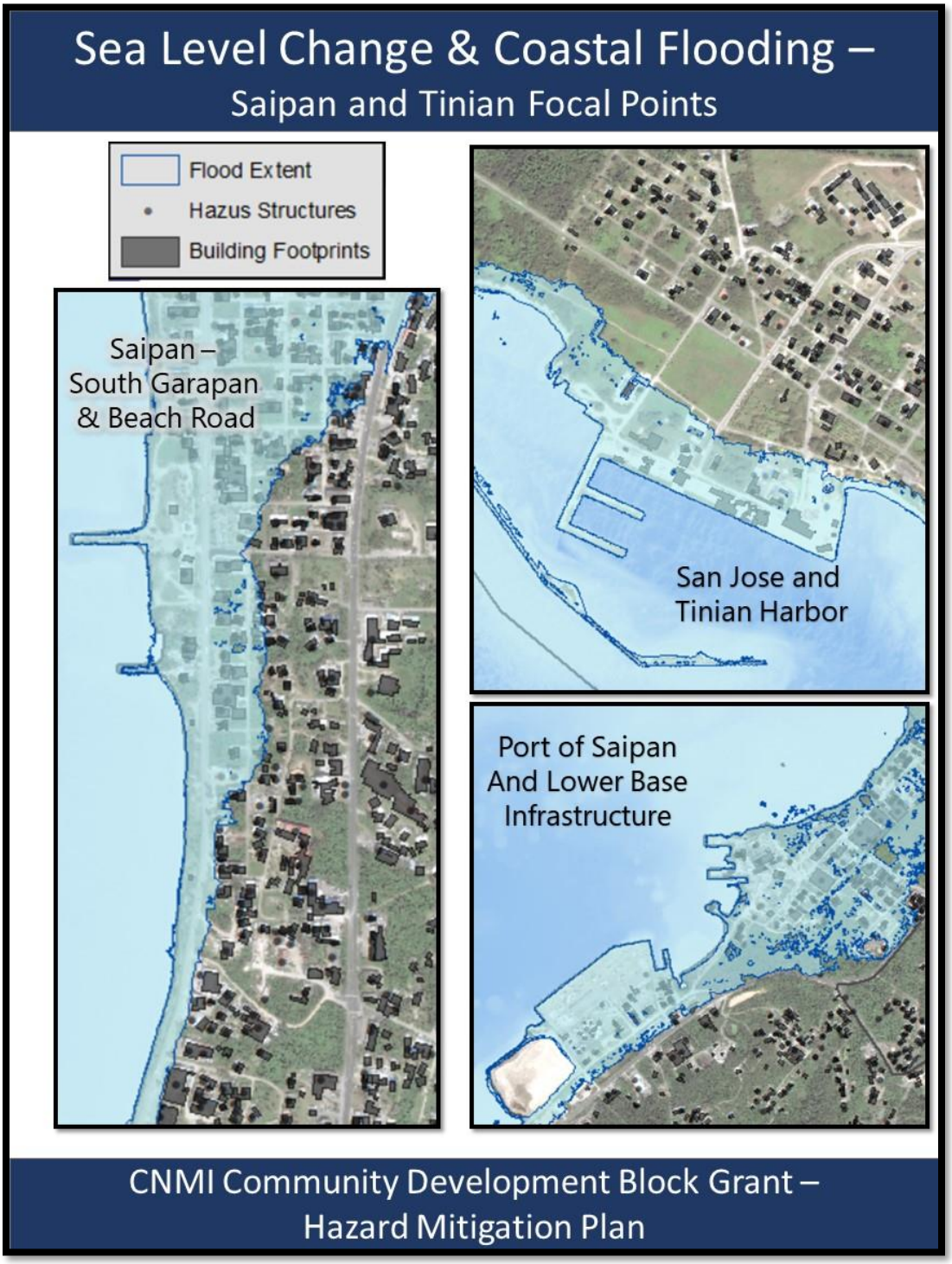
2017 Saipan Coastal Flood Mapping Updates: Scenario Descriptions						
Scenario	Data Code	Seasonal Extreme (meters)	Seasonal Extreme Description*	Sea Level Rise (m.)	Sea Level Rise Description**	Cumulative Sea Level Change (m.)
OND Seasonal Extreme (Typhoon Year)	OND_TY	1.85	Historically derived (1978-2003) maximum sea level for 100-year recurrence at Saipan Harbor, during the months of October - December including data from years with typhoon passage.	0	Climate change-related sea level rise not factored into this scenario.	1.85
50 years SLR	SLR50	0	No seasonal extreme estimates factored into this scenario.	1.31	Sea level rise projection for 2067 based on NOAA 2017 "High" curve and U.S. Army Corps sea level curve calculator for Apra Harbor tide gauge (local vertical land movement)	1.31
30 years SLR + OND Seasonal Extreme	SLR30_OND	0.63	Historically derived (1978-2003) maximum sea level estimate for 100-year recurrence at Saipan Harbor for months Oct.-Dec., with Typhoon-affected data removed.	0.74	Sea level rise projection for 2047 based on NOAA 2017 "High" curve and U.S. Army Corps sea level curve calculator for Apra Harbor tide gauge (local vertical land movement)	1.37
50 years SLR + OND Seasonal Extreme	SLR50_OND	0.63	Historically derived (1978-2003) maximum sea level estimate for 100-year recurrence at Saipan Harbor for months Oct.-Dec., with Typhoon-affected data removed.	1.31	Sea level rise projection for 2067 based on NOAA 2017 "High" curve and U.S. Army Corps sea level curve calculator for Apra Harbor tide gauge (local vertical land movement)	1.94
75 years SLR + OND Seasonal Extreme	SLR75_OND	0.63	Historically derived (1978-2003) maximum sea level estimate for 100-year recurrence at Saipan Harbor for months Oct.-Dec., with Typhoon-affected data removed.	2.14	Sea level rise projection for 2093 based on NOAA 2017 "High" curve and U.S. Army Corps sea level curve calculator for Apra Harbor tide gauge (local vertical land movement)	2.77
50 years SLR + OND Seasonal Typhoon Year	SLR50_ONDTY	1.85	Historically derived (1978-2003) maximum sea level for 100 year recurrence interval at Saipan Harbor, during the months of October - December including data from years with typhoon passage.	1.31	Sea level rise projection for 2067 based on NOAA 2017 "High" curve and U.S. Army Corps sea level curve calculator for Apra Harbor tide gauge (local vertical land movement)	3.16
* See **Chowdhury, Md. R., Chu, P., Zhao, X., Schroeder, T.A., and Marra, J.J. (2010). Sea level extremes in the U.S.-Affiliated Pacific Islands—a coastal hazard scenario to aid in decision analyses. *Journal of Coastal Conservation. 14*:1, pp 53-62.**						
** See **http://corpsclimate.us/ccaceslcurves.cfm (Revised 2017)** and ***U.S. Army Corps of Engineers. (2011). Sea Level Change Considerations for Civil Works Programs. U.S. Army Corps Circular 1065-2-212. http://corpsclimate.us/docs/EC_1165-2-212%20-Final_10_Nov_2011.pdf***						

Although not formally codified in law or state regulations, the ad-hoc sea level planning committee recommended adopting a scenario with a temporary, cumulative sea-level change of 3.16 meters above the current level by the year 2067 ("SLR50_ONDTY" in Figure 35). While this scenario seems extreme, it is based on seasonal coastal flooding threats coupled with a high rate of long-term sea level rise. Estimates for the temporary sea level change are based on seasonal extremes for CNMI between October and December (OND) for a 100-year return interval, combined with higher seas due to tropical cyclone activity. Long-term sea level rise is estimated for 50 years of incremental increase based on a high greenhouse gas emissions scenario (NOAA 2017 "High" sea level curve). Based on current planning and land lease practices in CNMI, and risk aversion for new development investments, a 50-year planning horizon was chosen for this scenario.

This CNMI-specific sea level change scenario was mapped for Saipan, Tinian, and Rota using the same methodology as the NOAA Sea Level Rise Viewer and NOAA Coastal Flood Exposure Mapper, revealing areas that are particularly vulnerable to increasing exposure to coastal floods. Figure 36 highlights several potential coastal flooding "hot spots" on Saipan and Tinian under the CNMI's extreme sea level change scenario. Sea level rise mapping layers are

factored into the flood hazard index used in Section 3, which serves as a primary influence on mitigation prioritization.

36: Map of Sea Level Change Inundation Focal Areas on Saipan and Tinian



Coral Reef Degradation and Coastal Defense Infrastructure

The most visible and tangible impacts that can be attributed to a changing climate in CNMI relate to coral reef ecosystem degradation. Coral reefs in the CNMI have declined drastically over the last decade, due in large part to multiple thermal stress and mass bleaching events, which occurred in 2013, 2014, and 2017. A 2018 survey of 34 shallow forereef sites around Saipan that were previously surveyed in 2012 showed over a 65% reduction in overall coral cover, with an estimated 90% loss of branching and structure-building corals in some locations (Maynard et al., 2019). Additionally, over 90% of staghorn (*Acropora* spp.) corals at long-term reef monitoring sites in the Saipan Lagoon were lost after the consecutive 2013-2014 bleaching events (BECQ-DCRM Marine Monitoring Team, unpub. data). There is high confidence that thermal stress events will continue to increase in frequency and intensity in the coming years (Grecni et. al 2021). Unless coral species adapt to ocean warming, all coral reef areas in the CNMI are projected to begin experiencing annual severe bleaching before 2045, and some areas are expected to experience annual severe bleaching beginning by 2030 (van Hooidonk et al. 2016).

This loss of coral reef ecosystems is central to conversations around coastal and island community resilience, and hazard mitigation in particular. At a broad level, mitigation is most effective in communities that have the resources and adaptability to implement and *maintain* mitigation projects. A resilient economy is a critical element in achieving this adaptive capacity, and the coral reef ecosystems around Saipan, Tinian, and Rota contribute $104.5 million annually to the Commonwealth's economy (Eastern Research Group, 2019). While much of this contribution derives from tourism value ($65.6 million annually), coral ecosystems also provide quantifiable value in the form of fishing, recreation, biodiversity research, and most importantly with respect to mitigation – coastal defense and shoreline protection ($21.2 million annually in nature-based coastal defense infrastructure).

The coastal protection function of coral reefs emerges from the reef's capacity to dissipate wave energy prior to it reaching the shoreline. The two main coastline characteristics that determine the relative wave energy dissipation by coral reefs are water depth and coral cover, with healthy, extensive coral coverage thriving near the shallow reef crest contributing the most to wave hazard reduction (van Zanten et al. 2014). A healthy coral reef system will absorb an average of 97% of wave energy, with the reef crest alone reducing hazardous waves by 86% (Ferrario et al. 2014).

In order to quantify the services of U.S. coral reefs as coastal protection infrastructure, researchers from USGS and The Nature Conservancy completed a risk-based valuation of coastal protection benefits from reefs throughout the U.S. Territories in the Pacific and Caribbean (Storlazzi et al. 2019). Flood risk reduction was quantified by mapping coastal inundation zones for different storm probabilities along U.S. reef-lined shorelines, and then re-mapping those zones without the presence of coral reefs factored in to the model.

Results of this study for the CDBG-MIT most impacted and distressed areas of Saipan and Tinian reveal that the fringing and barrier reefs around those islands protect at least $16.1 million in building values from a 100-year storm, and $8.2 million in economic activity (businesses) annually.

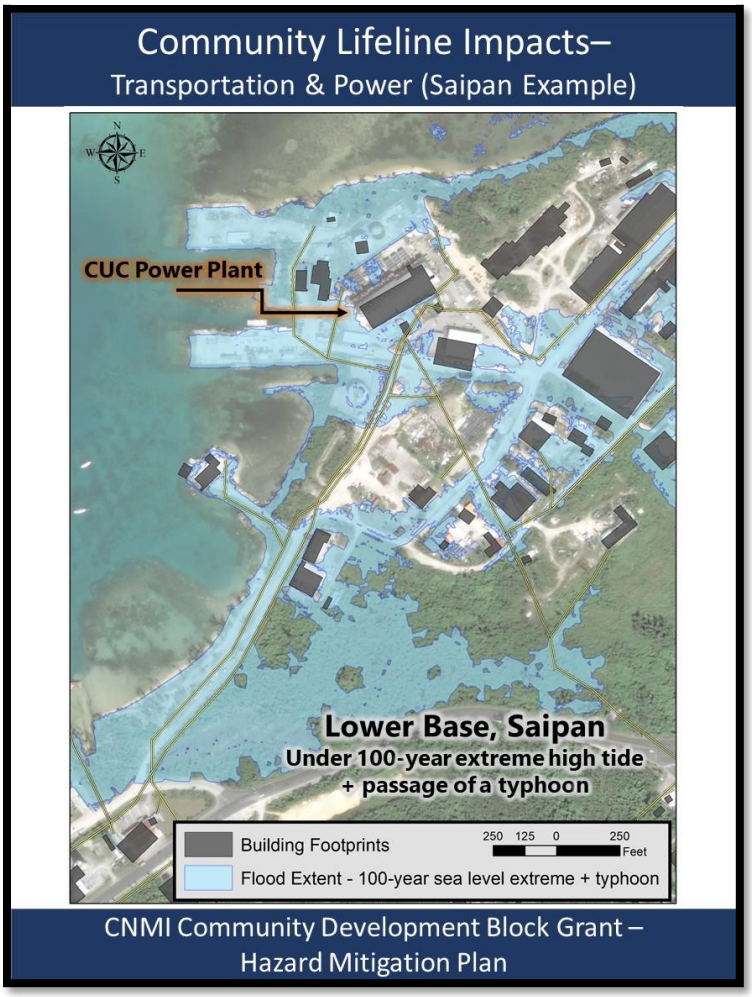
Given the immense amount of value and risk reduction benefits afforded by coral reefs in the CNMI, these systems can be viewed as potential nature-based solutions and mitigation

structures in the context of coastal flood hazards. This perspective, which frames certain natural features as infrastructure, is being adopted at both federal and state levels where hazard mitigation assistance is increasingly supporting actions such as hybrid "living" shorelines to mitigate erosion, and coral reef restoration as a means of defending coastal communities from storms. These approaches are discussed further in Section 3.4, but it is important to note that there is growing precedent for the restoration and propagation of reef-building corals and other coastal ecosystems as mitigation actions. This includes FEMA support and funding for coral reef damage assessment, triage, and restoration in Puerto Rico following Hurricane Maria in 2017, and over $2.4 million in emergency coastal resilience funds to the CNMI Government and local partners for coral reef restoration, living shoreline implementation, and wetland enhancement projects on Saipan in 2020, following the Supplemental Appropriations Act of 2019 for disaster-affected areas.

2.1.6 Community Lifeline Connections

In assessing hazard exposure and risk in the Commonwealth it is vital to factor in past and potential future impacts to whole and interlinked systems. For example, coastal flood hazard profiles and analysis may identify a small segment of vulnerable access road in a flood plain, but the assessment should also include consideration of the water utilities and power distribution structures that, although outside of the flooded area, may be inaccessible should that segment of transportation infrastructure be impaired. Figure 37 illustrates an instance of this system exposure in Lower Base, Saipan, where road-based access to the island's primary energy source could be temporarily cut off. Through this "systems" approach it is possible to refine mitigation priorities to better address community-wide impacts, as opposed to a narrower focus on individual structures.

37: Flood Impact to Energy Community Lifeline on Saipan

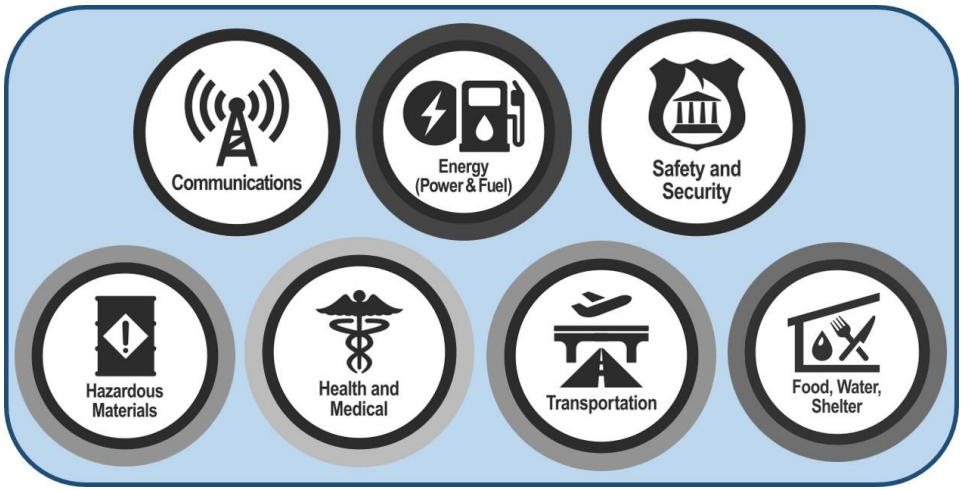


The U.S. Department of Homeland Security's "*Community Lifelines"* offer a useful means of framing hazard risks at this systems level. The lifelines are defined in FEMA's National Response Framework (DHS 2019) as services that enable a continuous operation of critical government and business functions that are essential to ensuring human, health, safety, and economic security. They serve

as the integrated and linked network of services, assets, infrastructure, and capabilities that sustain the needs of a community. The community lifeline framework was tested and validated during the response efforts to federally-declared disasters in 2018 and 2019, including Super Typhoon Yutu, and encompasses the following:

- Safety and Security: Law Enforcement/Security, Search and Rescue, Fire Services, Government Service, Responder Safety, and Imminent Hazard Mitigation
- Food, Water, and Sheltering: Evacuations, Schools, Food/Potable Water, Shelter, Durable Goods, Water, Infrastructure, and Agriculture
- Health and Medical (Medical Care/Hospitals): Patient Movement, Public Health, Fatality Management, Health Care, and Supply Chain
- Energy: Power (Grid), Temporary Power and Fuel
- Communications: Infrastructure, Alerts, Warnings, Messages, 911 and Dispatch, Responder Communication and Financial Services
- Transportation: Highway/Roadway, Mass Transit, Railway, Aviation, Maritime, and Pipeline
- Hazardous Materials: Facilities, Hazardous Debris, Pollutants and Contaminants

38: Community Lifelines from FEMA National Response Framework



While the community lifelines were developed initially within the context of emergency and disaster response, most of the resources encompassed by the various lifelines can also serve as targets for effective mitigation measures. In particular, the infrastructure necessary for fully functional communications, energy, water and transportation operations is configured in systems that can be retrofitted or enhanced through mitigation projects as part of the broader hazard preparedness cycle. As a result, the amount of time and resources needed to restore the associated lifeline in future disasters can be greatly reduced.

In the following section (3), the process and outcomes of prioritizing mitigation targets and assessing needs is discussed in the context of many of the community lifeline components (e.g. critical service facilities, water and power distribution, transportation network). The lifeline components are largely represented by a “community exposure index” that was used in delineating priority mitigation areas, and therefore factor significantly into the proposed mitigation actions recommended for CDBG-MIT funds. In addition, Appendix B lists the relevant community lifeline connections to priority CDBG mitigation actions and projects.

3.0 RISK AND PRIORITIZING MITIGATION NEEDS

Mitigation priorities are established through due consideration of both the geographic distribution of hazard risks, as well as outcomes from relevant, collaborative mitigation planning efforts. The CNMI 2018 SSMP, which contains a risk analysis of all identified hazards, along with other relevant resources, data, and stakeholder input, provided initial guidance on actions that NMHC will pursue with mitigation funding. Additional planning efforts that are informing hazard mitigation actions are discussed under Section 5 (Coordination).

The hazards analysis conducted in the SSMP considered the probability of occurrence as well as potential impacts to people, property, and the economy. Based upon this assessment, the CNMI's hazards were then ranked and assigned priority tiers for implementing mitigation actions and pursuing mitigation grant funding. Storm (tropical cyclone) impacts and flooding hazards (both coastal and inland) emerged as the top priorities for mitigation, and were therefore analyzed in further detail using the most recent and best available data, resulting in the identification of target areas, assets, and infrastructure. The analyses and prioritization are detailed in the following subsections, and were partially driven by data related to low-to-moderate income and socially vulnerable populations.

3.1 Hazard Frequency

In the 2018 SSMP, the potential frequency of a hazard's occurrence was assigned one of the following probability factors:

- High: Hazard has a 25-year recurrence interval, or 4% annual chance (Probability Factor: 3)
- Medium: Hazard has greater than a 100-year recurrence interval, or >1% annual chance (Probability Factor: 2)
- Low: Hazard has less than a 100-year recurrence interval, or <1% annual chance (Probability Factor: 1)
- No Exposure: There is no probability of occurrence (Probability Factor: 0)

The SSMP assessment of hazard frequency was generally based on past hazard events in the area. Figure 39 summarizes the results of the SSMP probability assessment for each hazard of concern.

39: Hazard Categories and Associated Frequency of Occurrence (2018 SSMP)

Hazard Event	Probability (high, medium, low)	Probability Factor
Typhoon/Tropical Storm	High	3
Flooding	High	3
Earthquake	Medium	2
Volcanic Eruption	Medium	2
Tsunami	Medium	2
Drought	Medium	2
Wildfire	Medium	2

This assessment is useful in narrowing the focus of mitigation, but also requires further investigation into the resources and communities exposed to the highest ranked hazards.

3.2 Exposure, Impact, and Mitigation Priority Areas

To plan for mitigation actions that target these specific hazards, the geographic distribution of the hazard needed to be taken into consideration, alongside the location of community assets and infrastructure. From 2019 to 2020 these two components of risk (hazard coverage and resource exposure) were the focus of a comprehensive resiliency assessment conducted in collaboration with multiple local, state, and federal agencies (Dobson et al. 2020b). The assessment leveraged a variety of datasets and geospatial modeling to building spatially-explicit indices of exposure and risk. For the purposes of prioritizing CDBG-MIT actions, these data were extracted from the resiliency assessment products, and are used here as a key component for mapping mitigation needs. The results of this mapping exercise also constitute a significant factor in the broader scoring and ranking CDBG-MIT Action Plan projects.

This section provides a thorough description and explanation of this mitigation prioritization analysis, along with loss estimates for structural inventories in high-hazard areas and discussion of initial mitigation focal areas or infrastructure.

3.2.1 Cumulative Flood Risk and Impact

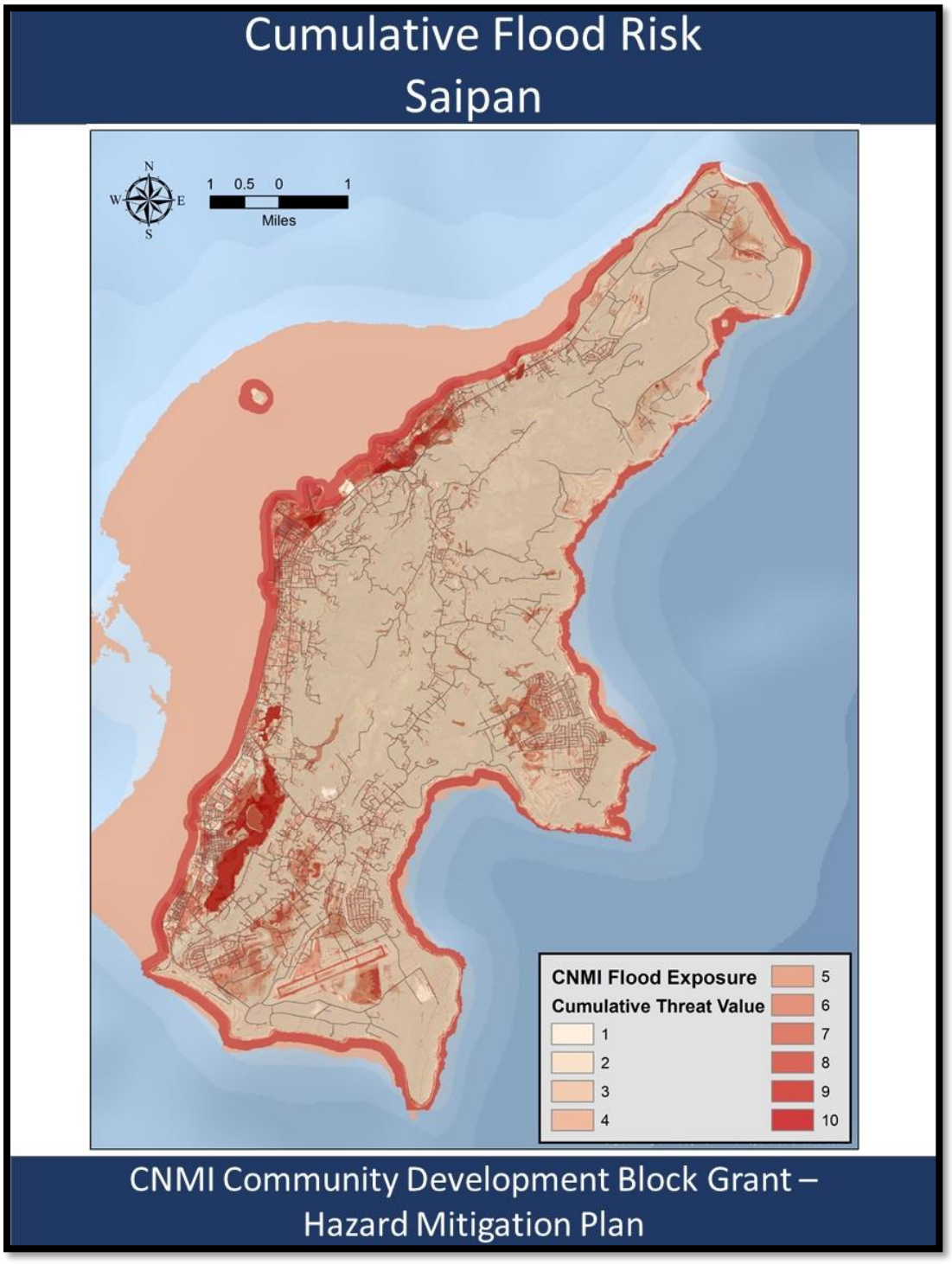
The flood hazards described in Section 2 derive from a number of different sources (typhoons, monsoon surges, etc…), and can be exacerbated by various characteristics of the built environment and landscape. To capture the multi-faceted nature of flooding, multiple spatial datasets were combined to form a cumulative flood risk index (Dobson et al. 2020b). The data used for analysis covered aspects of flood threats including sea level rise, flood-prone areas, wave run-up/coastal inundation from storms, soil erodibility, impermeable soils, and areas of low slope. These inputs are summarized below (Figure 40).

40: Components of Flood Threat Index

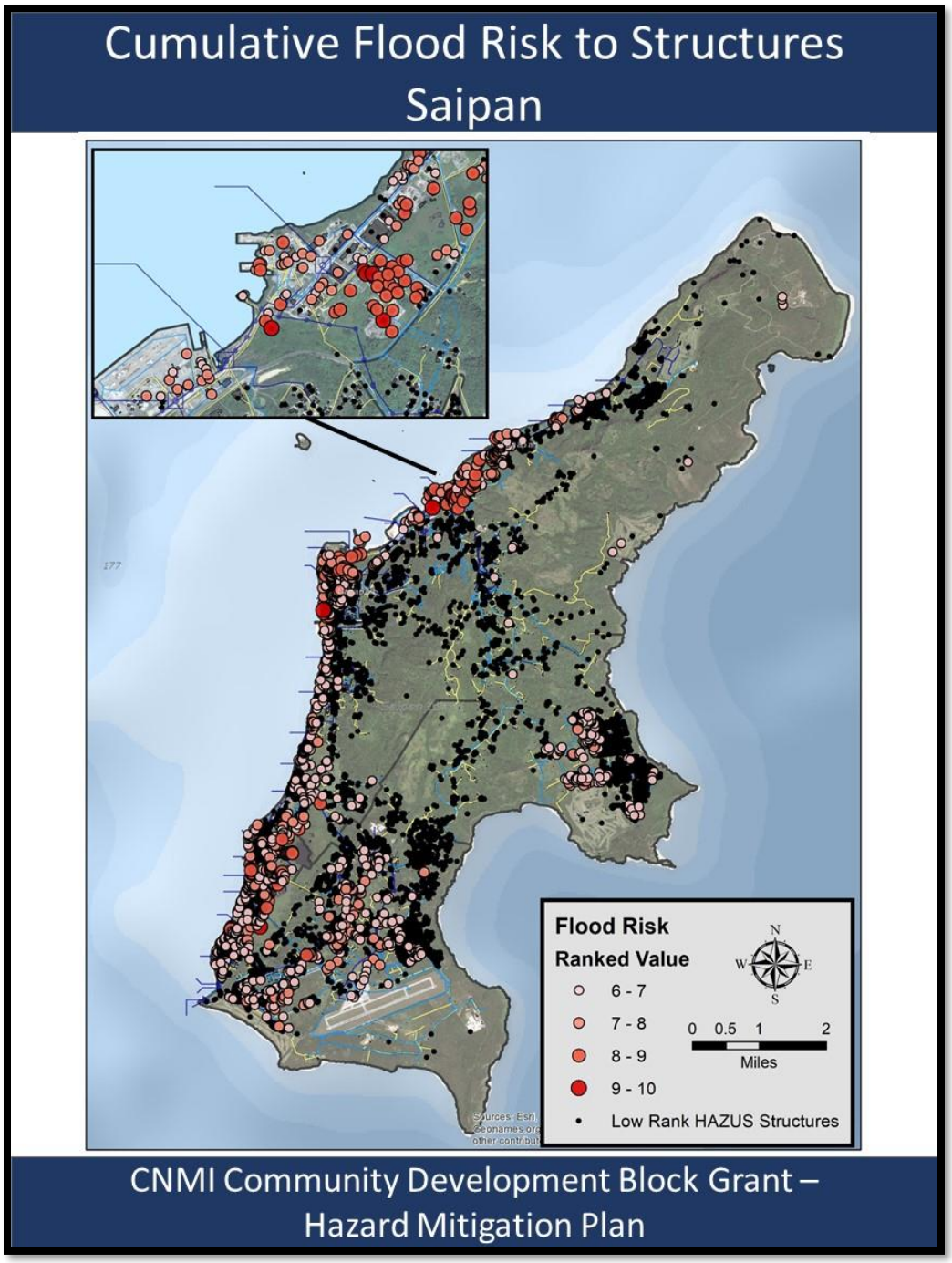
Flood Threat Component	Data Source
Flood-Prone Areas	FEMA National Flood Hazard Layers; USDA-NRCS SSURGO (2.2 or later)
Sea Level Rise	NOAA Office for Coastal Management Sea Level Rise Inundation Database
Wave-Driven Flooding	Floodmasks; USGS/Curt Storlazzi (Storlazzi et al. 2019)
Areas of Low Slope	USGS National Elevation Dataset, 10-meter resolution (most recent available)
Soil Erodibility	USDA-NRCS SSURGO (2.2. or later)
Impervious Surfaces	USDA-NRCS SSURGO (2.2 or later), NOAA Coastal Change Analysis Program Landcover (2014, Rota & Tinian; 2016, Saipan)

Each input in the flood threat index was ranked low to high, then combined and classified from 1-10 based on a percentile distribution (Ponce Manangan et al. 2014; Dobson et al. 2020b). The results of mapping this index on Saipan, Tinian, and Rota are highlighted in the following pages (Figures 41-46), along with brief discussion of the geographic distribution of cumulative flood threats and structures that may be threatened.

41: Cumulative Flood Threat to Saipan



42: Cumulative Flood Risk by Structure - Saipan

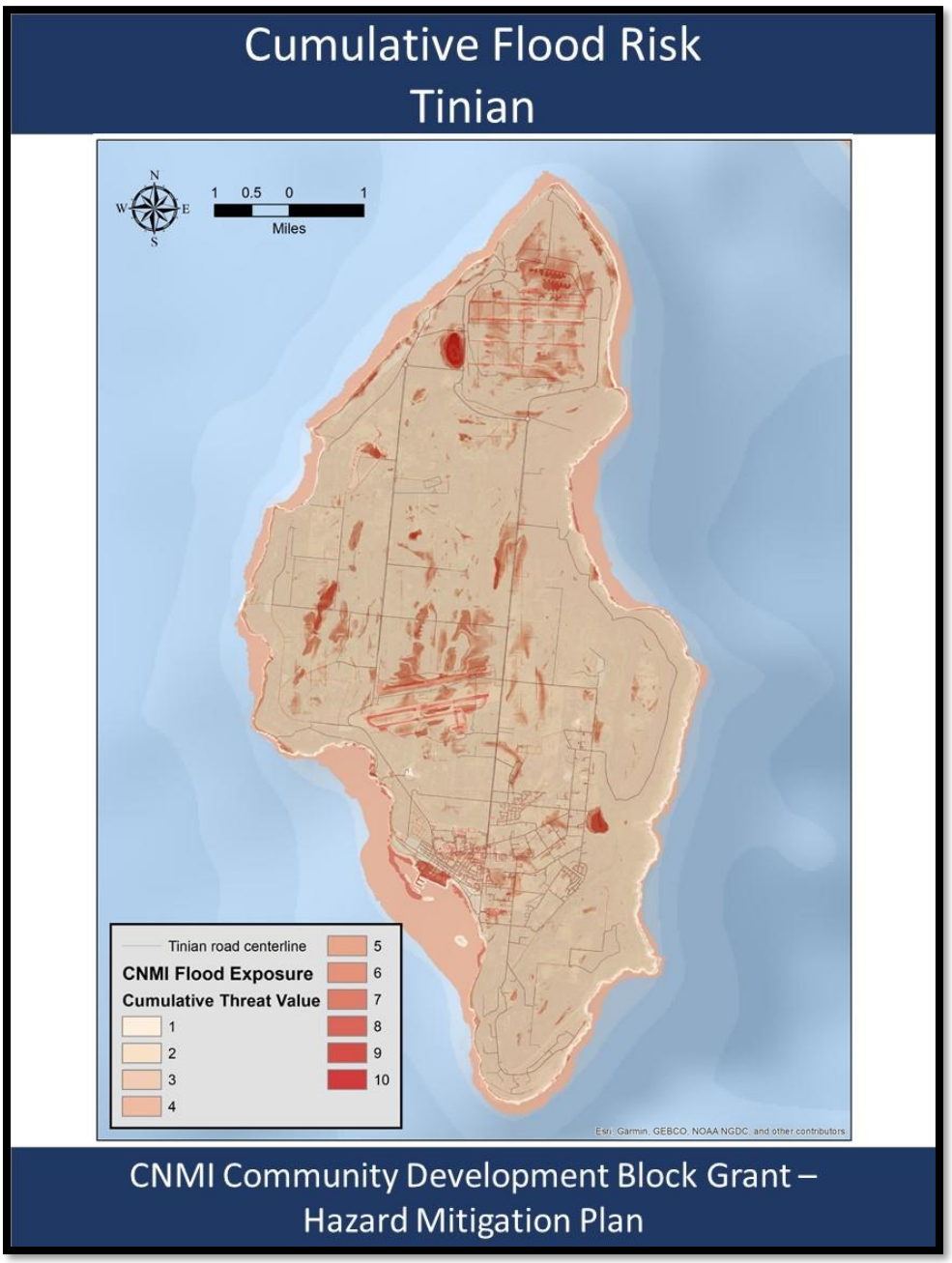


The flood index for Saipan reveals a particularly high threat along Saipan's western coastal plain, especially within the villages of Tanapag, Lower Base, Garapan, Susupe, and Chalan Kanoa. These areas are susceptible to both inland flooding from extreme precipitation events and coastal flooding from extreme sea levels and wave run-up. Index values of 9-10 are present around wetland systems near Lake Susupe, Lower Base, and American Memorial Park. Importantly, the latter area is hydrologically connected with the Garapan urban core via

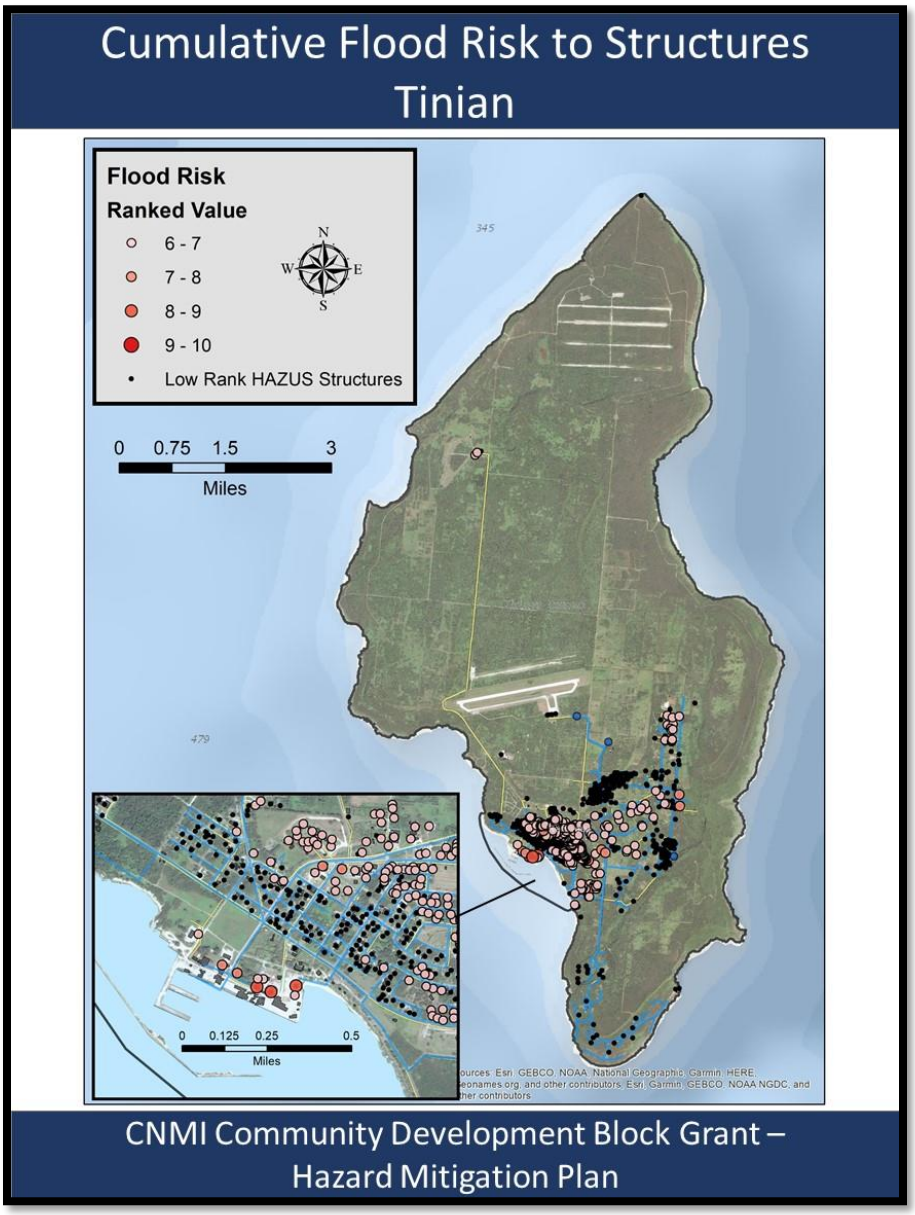
stormwater infrastructure. Additional, higher-elevation areas around Kagman and Koblerville have a combination of low slope, impermeable surfaces, and erodible soils that result in a greater likelihood of inland flooding during storm events.

Assessing the threat of flooding to individual features (Figure 42) also yields important results with respect to mitigation needs. In particular the Commonwealth Utilities Corporation assets in Lower Base, including the primary power source for Saipan, are exposed to this threat. Stormwater infrastructure, lift stations, and some primary freshwater distribution lines spanning the Beach Road corridor are also characterized by some of the highest flood risk rankings.

43: Cumulative Flood Threat to Tinian



44: Cumulative Flood Risk by Structure - Tinian

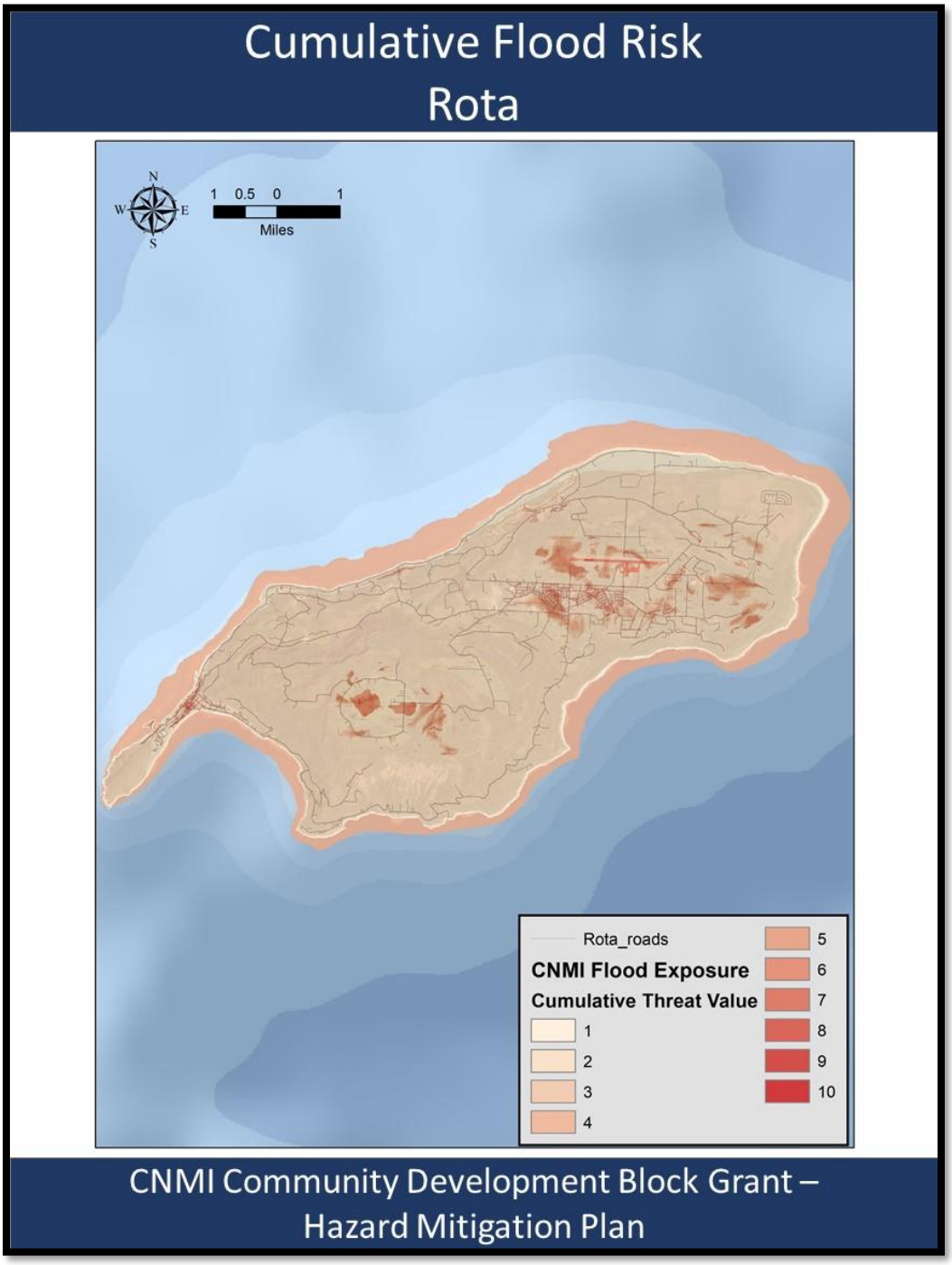


Flood risk on Tinian is relatively low in comparison to Saipan, in part due to the absence of extreme low-lying coastal areas. Many areas that have high flood rankings are in unpopulated and undeveloped portions of the island that simply have the potential for ponding. In some cases these areas of ponding are actually wetland systems that are critical to agricultural activity and livestock on the island. Much of the flood-prone area also overlaps with the land leased to the U.S. military, which covers roughly the northern two-thirds of the island. NMHC determined the lands and associated infrastructure leased to the U.S. Department of Defense to be outside the geographic scope of CDBG mitigation activity, leaving the focus for hazard mitigation on the villages of San Jose and Carolinas Heights, as well as Tinian Harbor.

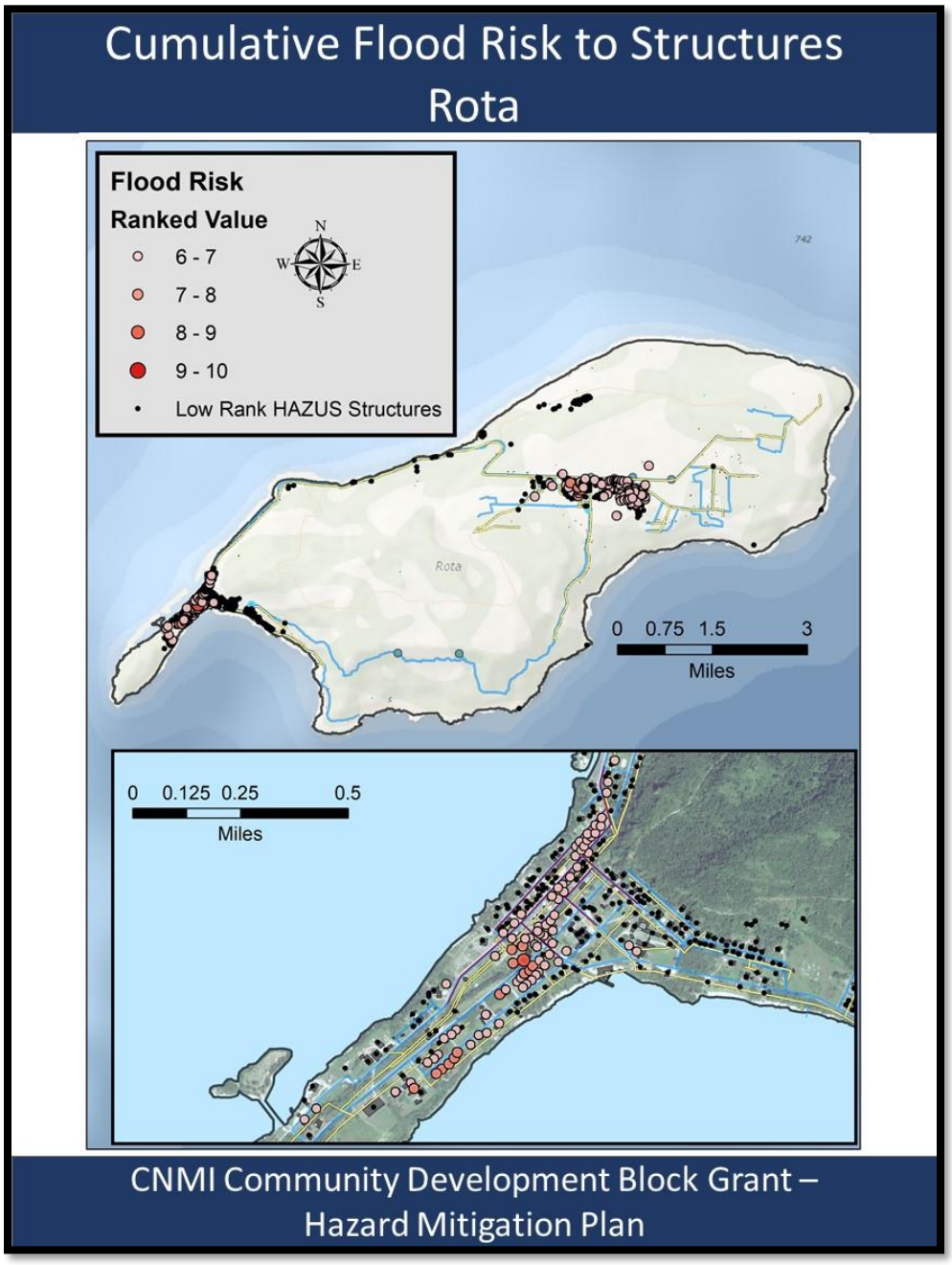
Structures around Tinian Harbor face the greatest flood threat from tropical cyclones, and have experienced significant impacts and damage from storm surge and associated wave run-up in

the past (BECQ 2015); however, it should also be noted that Marpo Heights and Carolinas Heights face both a moderate flood threat ranking and sit adjacent to some of the most extreme wind zones on the island. Given that high winds and drought have historically had some of the greatest impacts on Tinian (BECQ 2015), mitigation activities for the island may also be focused on water distribution systems and enhancing or hardening structures for extreme winds.

45: Cumulative Flood Threat to Rota



46: Cumulative Flood Risk by Structure - Rota



Flood threats on Rota and at-risk structures coincide with the most populated villages, Sinapalo and Songsong. These areas contain the greatest concentration of impervious surfaces on the island, and are characterized by topography with very low slope. Songsong is also directly exposed to impacts from coastal flooding in response to tropical cyclones and southwesterly monsoon surges (BECQ 2015). Hazard profiles in Section 2 of this action plan describe some

of the historic impacts to the village, but it should also be noted that sea level rise (which factors into the cumulative flood threat) will exacerbate future flood impacts.

Although Rota is not included in the MID areas for CDBG-MIT funding, any flood mitigation actions considered for Saipan and Tinian should be explored for applicability to the Songsong area through compatible mitigation funding sources.

Overall, the structures and buildings that ranked in the upper 50% of cumulative flood risk values across all three islands have a total structural value of $695,345,986, and building contents values of $623,715,801. These figures were derived from extracting flood risk values to individual structure data points and associated valuations in the FEMA Hazus database for CNMI.

3.2.2 Social Vulnerability and LMI Populations

In the process of identifying priority mitigation areas and needs it is critical to ensure that a community's ability to respond to and cope with the effects of hazards is taken into account. This is partially accomplished through mapping and consideration of social vulnerability. For the purposes of CDBG-MIT activities, social vulnerability is defined by a variety of demographic variables that can influence the ease or difficulty that a household or village may have in dealing with hazards. During the CNMI's collaborative resilience assessment process (Dobson et al. 2020a), the methods for mapping social vulnerability on Saipan (Greene and Skeele 2014) were expanded to Rota and Tinian.

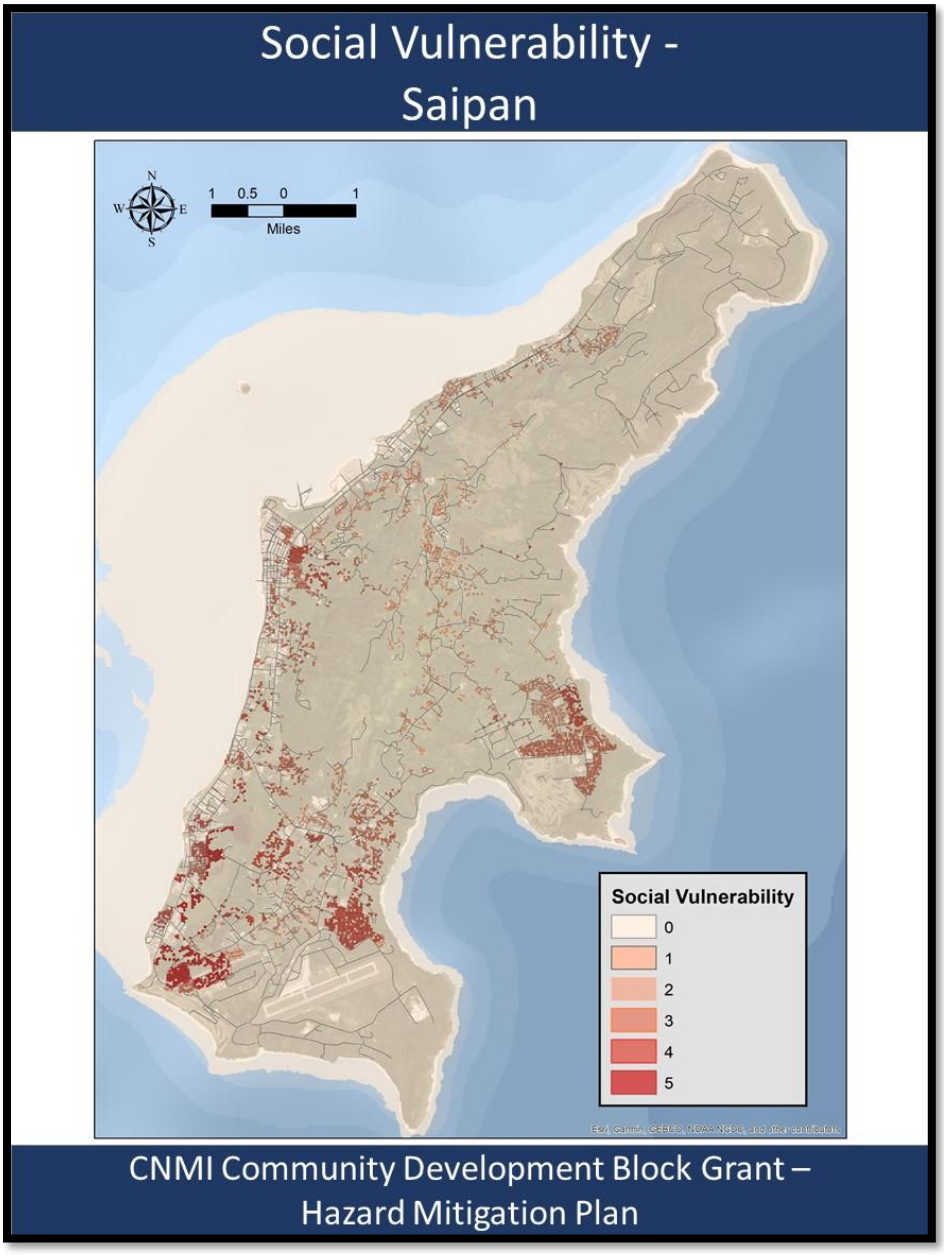
Figure 47 lists the demographic characteristics that were taken into account in assessing social vulnerability in the CNMI, while Figures 48-50 highlight the geographic distribution of vulnerability on Saipan, Tinian, and Rota. Notably, the index includes factors that represent low-to-moderate income (LMI) populations, and therefore accounts for these groups in the mitigation prioritization process. All data and vulnerability values were derived from the 2010 decennial census at the village level, and then extracted to building footprints to visually represent social vulnerability at a household level.

47: CNMI Social Vulnerability Index Components

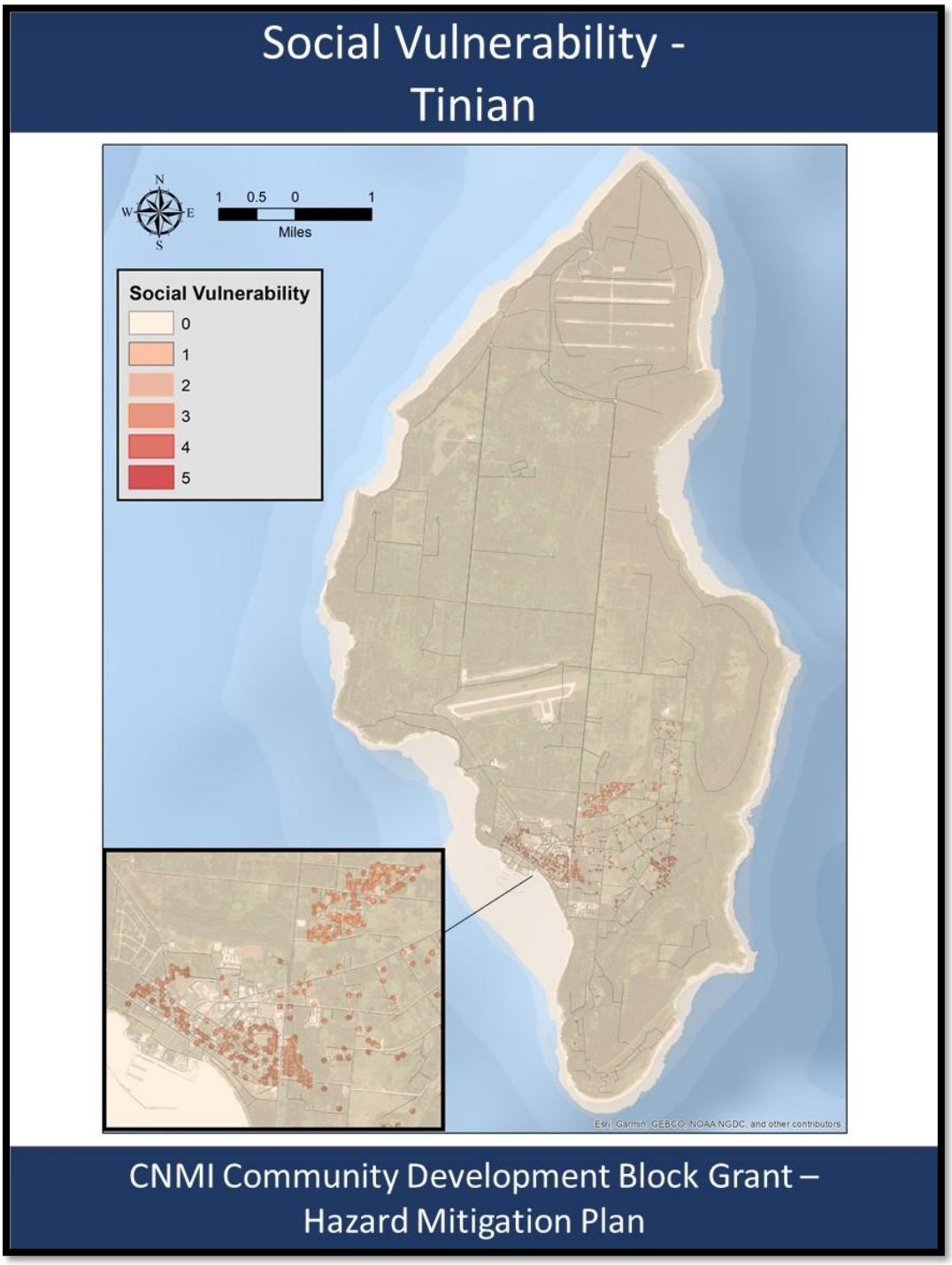
Social Vulnerability Index Variables and Weights (weights 0.0 - 1.0)
Average Household Size (0.75)
Median Household Income (0.5)
Median Rent (.75)
Percentage of Population 25 and Older with Bachelors Degree (0.5)
Percentage of Population 25 and Older with High School Education (0.5)
Percentage of Population Disabled (0.75)
Percentage of Population Below Poverty Line (1)
Percent of Houses with Metal Roof (0.5)
Percent of Houses with Metal Wall (0.5)
Percent of Houses Mobile or Non-permanent (0.5)
Percentage of Households without a Computer (0.25)
Percentage of Population with No Health Insurance (0.75)
Percentage of Households with No Radio (0.25)

Percentage of Households Receiving Social Security Income (0.5)
Percentage of Population Over 16 Relying Solely on Subsistence Activities (0.75)
Percentage of Population Over 16 Unemployed (1)
Percentage of Houses with Wood Roofs (0.5)
Percentage of Houses with Wood Walls (0.5)
Percentage of Houses Built on Wood Pilings (0.75)
Median Rent as a Percentage of Median Household Income (1)
Percent Non-Us Citizen (0.75)
Per Capita Income (1)

48: Map of Social Vulnerability on Saipan



49: Map of Social Vulnerability on Tinian



50: Map of Social Vulnerability on Rota

Social vulnerability, as quantified in the CNMI's Coastal Resilience Assessment, is highly variable throughout the populated islands. For Rota and Tinian, the highest vulnerability values are concentrated within the primary population centers of San Jose on Tinian, and Songsong and Sinapalo on Rota. On Saipan, greater variability among villages is apparent, with focal points to address vulnerable populations present in San Antonio, Chalan Kanoa, Susupe, Garapan, Kagman, and Dandan.

To inform a more comprehensive mitigation prioritization process, the social vulnerability index was used as an input into a broader community asset index. The latter accounts for concentrations of vulnerable populations and LMI areas, as well as the presence or absence of critical facilities and infrastructure associated with community lifelines. The index of community assets and infrastructure, as detailed in the following sub-section, is critical for prioritization as it allows for a more inclusive picture of not only vulnerable populations, but the infrastructure and lifelines that are connected to those populations. For example, freshwater distribution in certain vulnerable portions of Kagman is tied to broader infrastructure serving that entire area. Mitigation priorities may therefore be more reflective of this more inclusive community asset index.

3.2.3 Community Assets and Infrastructure Index

The community asset index was originally constructed during the development of CNMI's coastal resilience assessment, which leveraged substantial amounts of data and input from multiple CNMI government agencies and authoritative federal datasets. The primary inputs and associated data sources are listed below in Figure 51, and together provide a more complete picture of areas that should be prioritized for mitigation based on the people and resources located there.

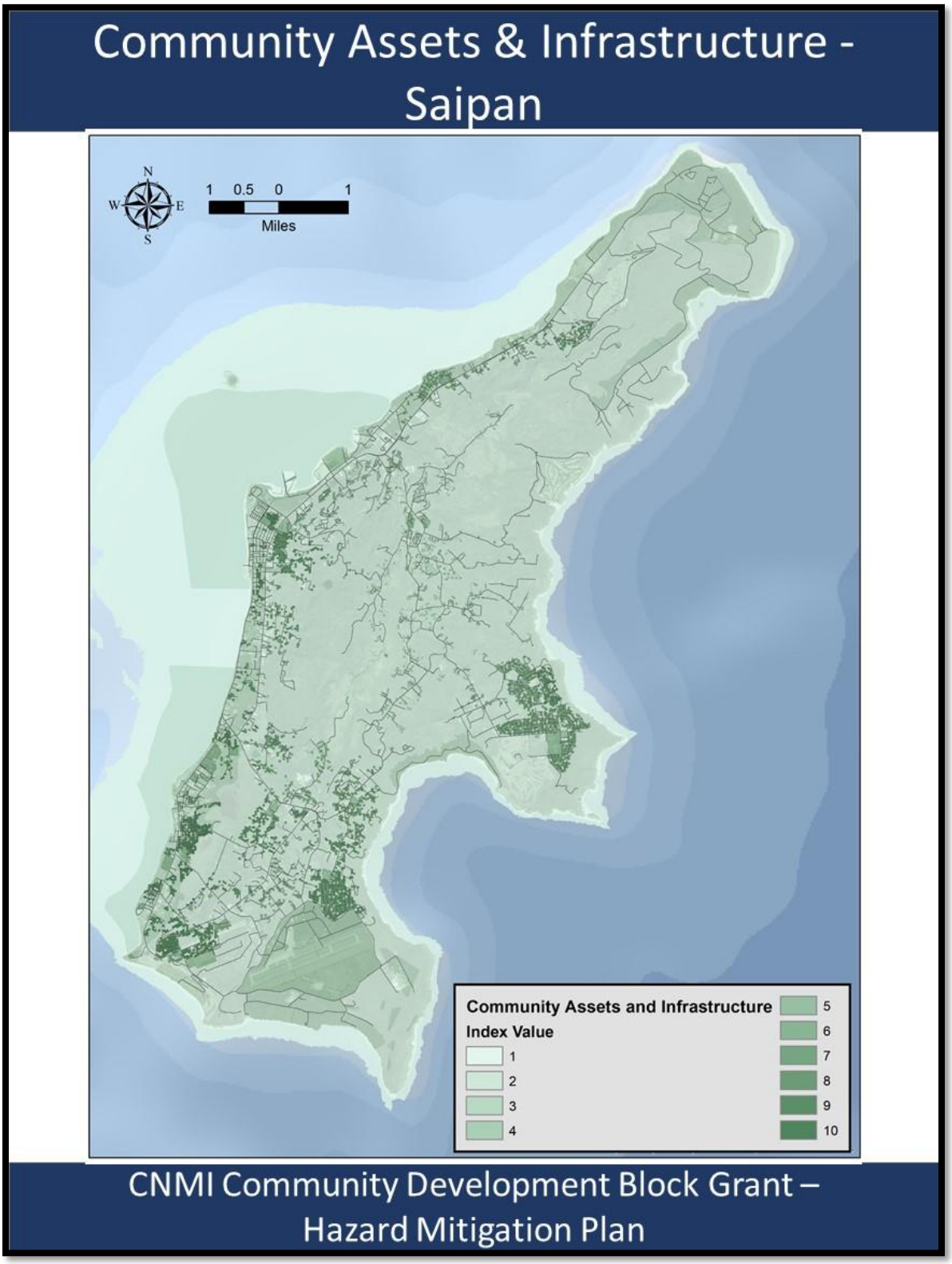
51: Community Asset Index Inputs (Dobson et al. 2020a)

Layer Name	Dataset and Source
Population Density	U.S. Census Bureau, 2010 Decennial Census - place geography (demographic summary profile)
Social Vulnerability	U.S. Census Bureau, 2010 Decennial Census - place geography (demographic summary profile)
Critical Facilities	Schools: USGS National Structures Dataset; Law Enforcement, Fire Stations, and Medical Facilities: CNMI Dept. of Public Lands
Parcels	CNMI Dept. of Public Lands
Building Footprints	Open Street Maps
Critical Infrastructure *(Various Inputs, see below)*	
Primary roads	*Open Street Maps*
Airport runways	*National Transportation Atlas Database: Airport Runways (2015 or later)*
Ports	*Locations identified using information from the Commonwealth Ports Authority, digitized by NEMAC*
Power Plants	*CNMI Dept. of Public Lands*
Wastewater treatment facilities, potable water	*CNMI Dept. of Public Lands*
Petroleum terminals	*U.S. Energy Information Administration: EIA-815, Monthly Bulk Terminal and Blender Report*

Hazardous Sites/Landfill	*CNMI Dept. of Public Lands*
Cultural, Historic, and Sensitive Sites	*CNMI Historic Preservation Office*
Communication Infrastructure	*CNMI Dept. of Public Lands*

Figures 52-54 illustrate the distribution of community asset index values across Saipan, Tinian, and Rota. While the index maps on the following pages correspond with many of the areas that should be prioritized based solely on social vulnerability scores, the geographic spread of these values is expanded beyond immediate population centers to encompass some of the lifeline infrastructure and systems that serve these areas. This expanded scope of mitigation priorities is taken into account in this action plan's list of proposed mitigation actions, and includes assets and infrastructure that span multiple villages, particularly on Saipan. Features such as critical transportation routes, emergency facilities, and water infrastructure factor heavily in the index maps, and provide rationale for proposing mitigation strategies that address infrastructure at this broader scale. These more inclusive, strategic actions are discussed in greater detail in Section 3.3.

52: Map of Community Asset Index - Saipan



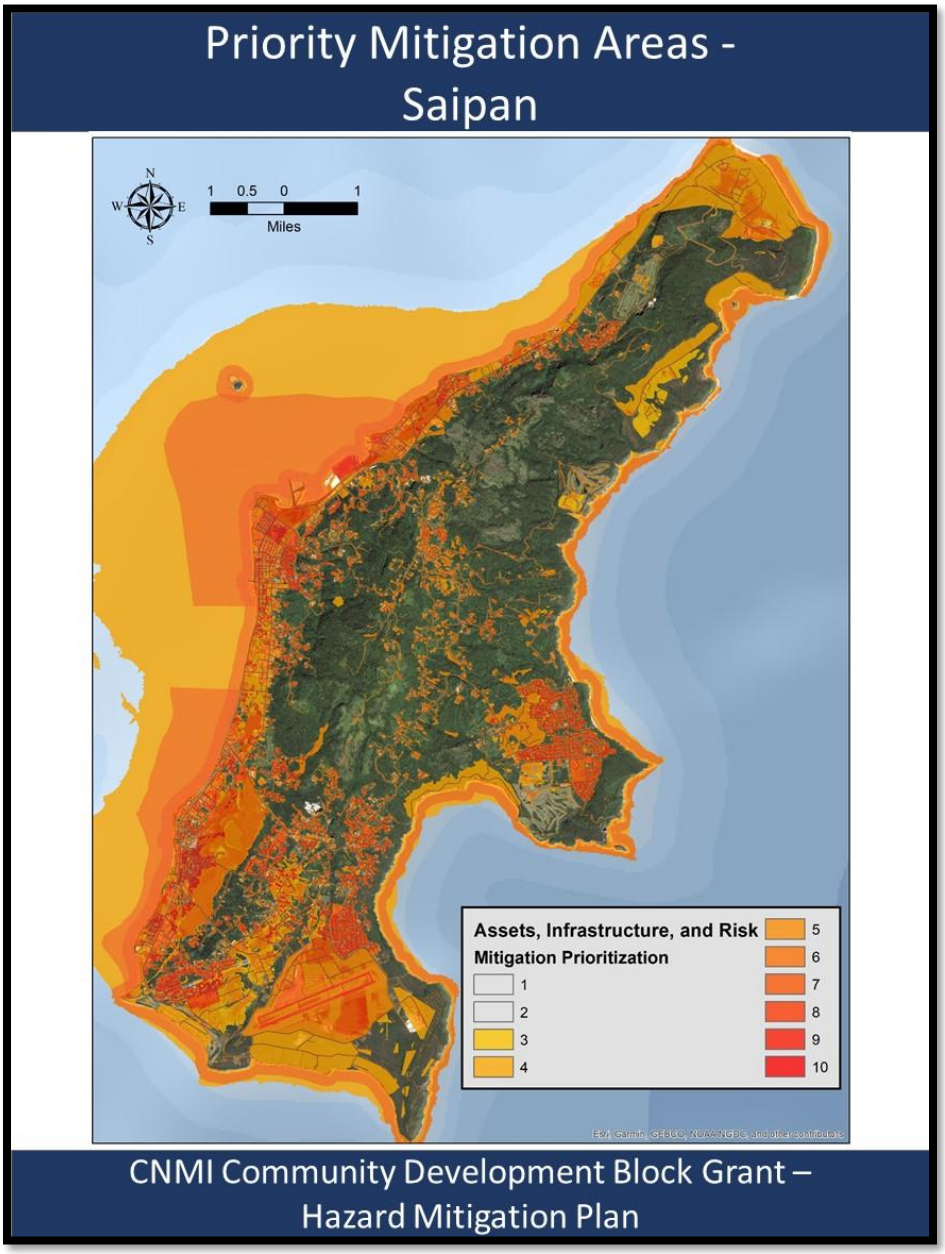
53: Map of Community Asset Index - Tinian

54: Map of Community Asset Index - Rota

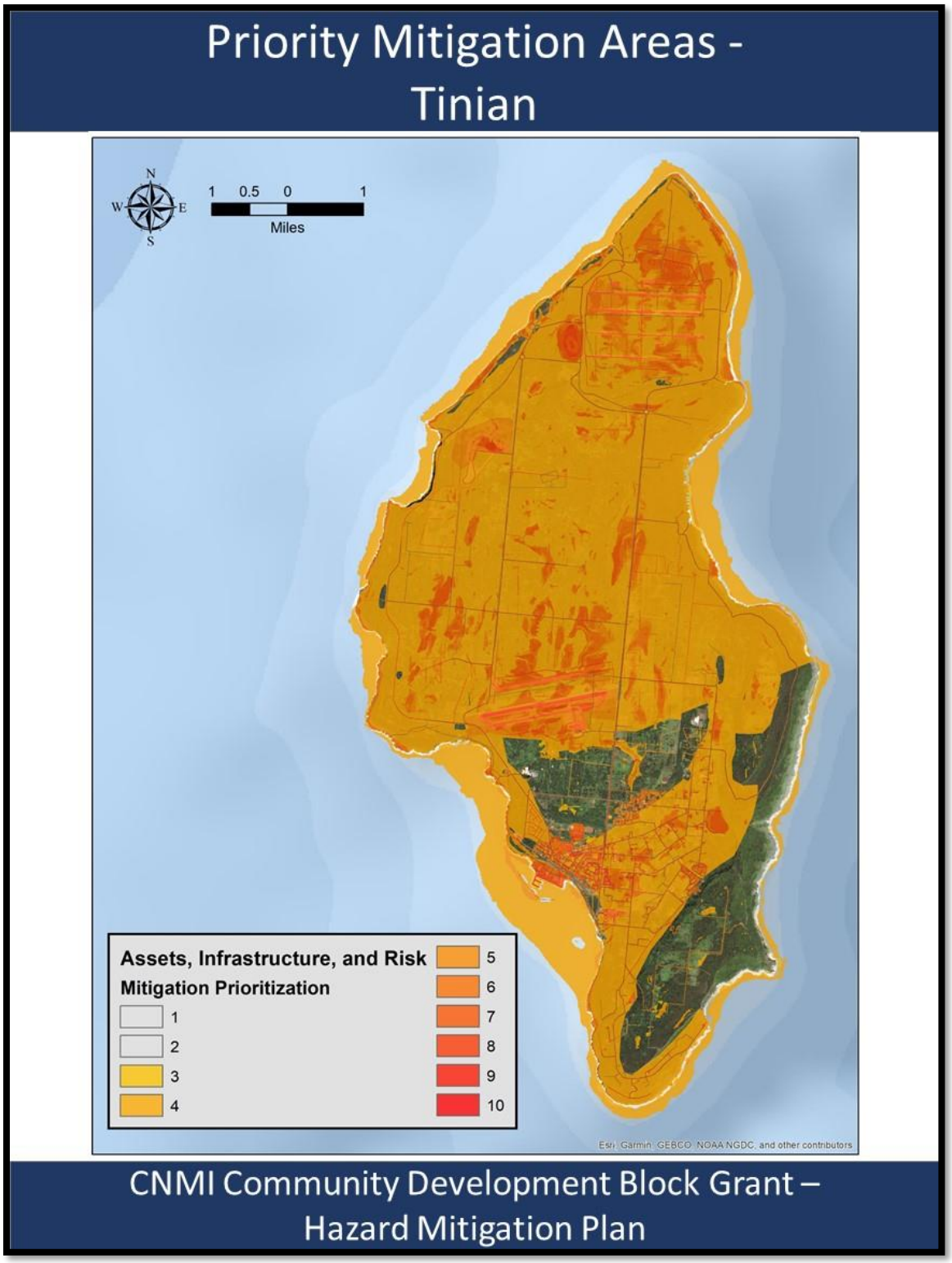
3.2.4 Hazard Mitigation Priority Areas

The final step in the initial identification of priority mitigation areas, features, and systems involves combining index scores for both community assets (3.2.3) and hazard threats (3.2.1) to create maps of priority values. The maps on the following pages (Figures 55-57) highlight areas that have significant overlap among priority populations, infrastructure, and exposure to hazards. In line with the methodology employed by Dobson et al. (2020a; 2020b) in the CNMI's coastal resilience assessment, the asset and threat indices were multiplied, resulting in values of 1-100, and then re-classified into a ranking of 1-10. This ranking serves as a proxy for the initial CDBG-MIT mitigation prioritization, and is further broken down and discussed in the context of parcels and structures in Section 3.2.5.

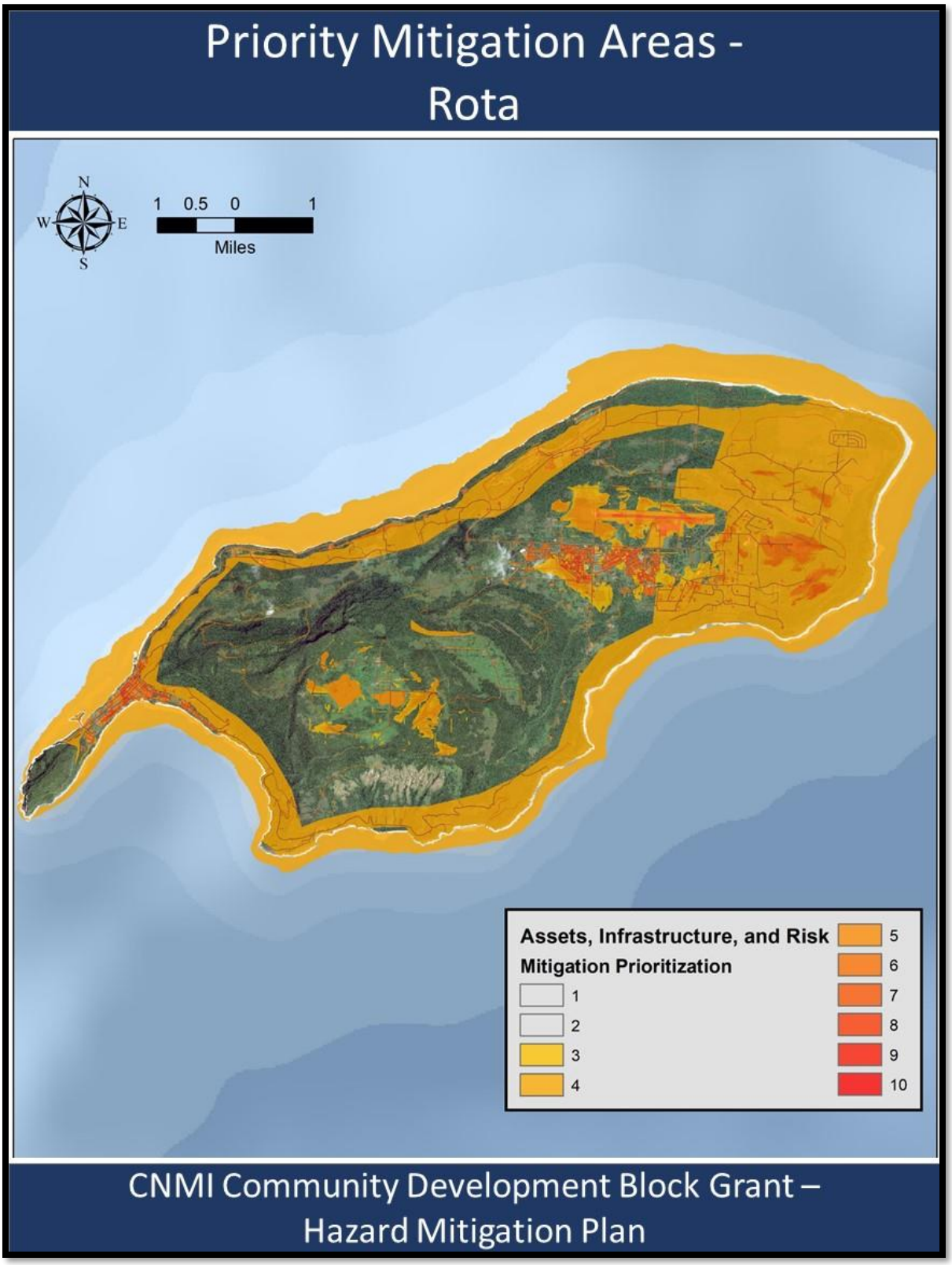
55: Priority Mitigation Areas - Saipan



56: Priority Mitigation Areas - Tinian



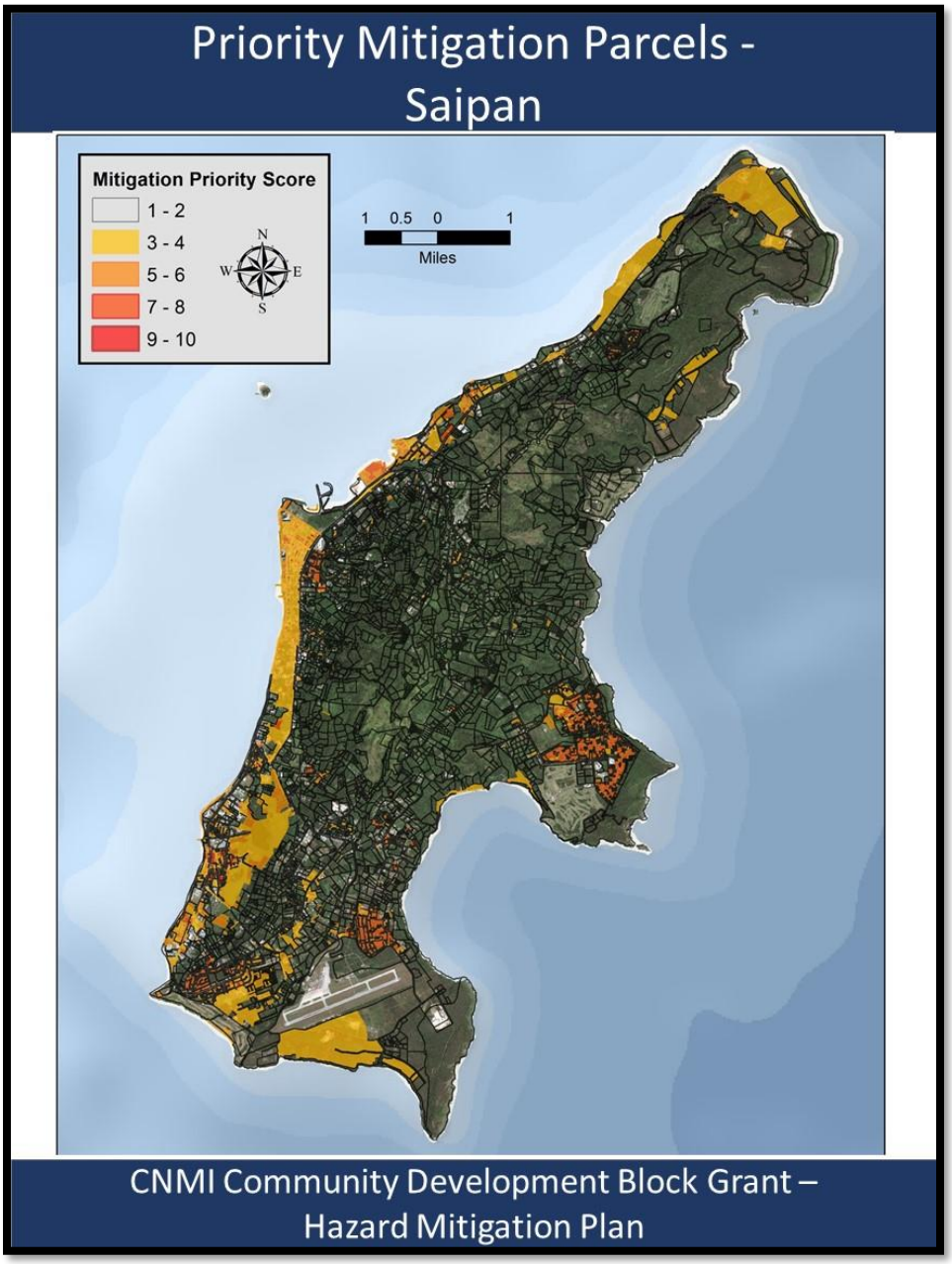
57: Priority Mitigation Areas - Rota



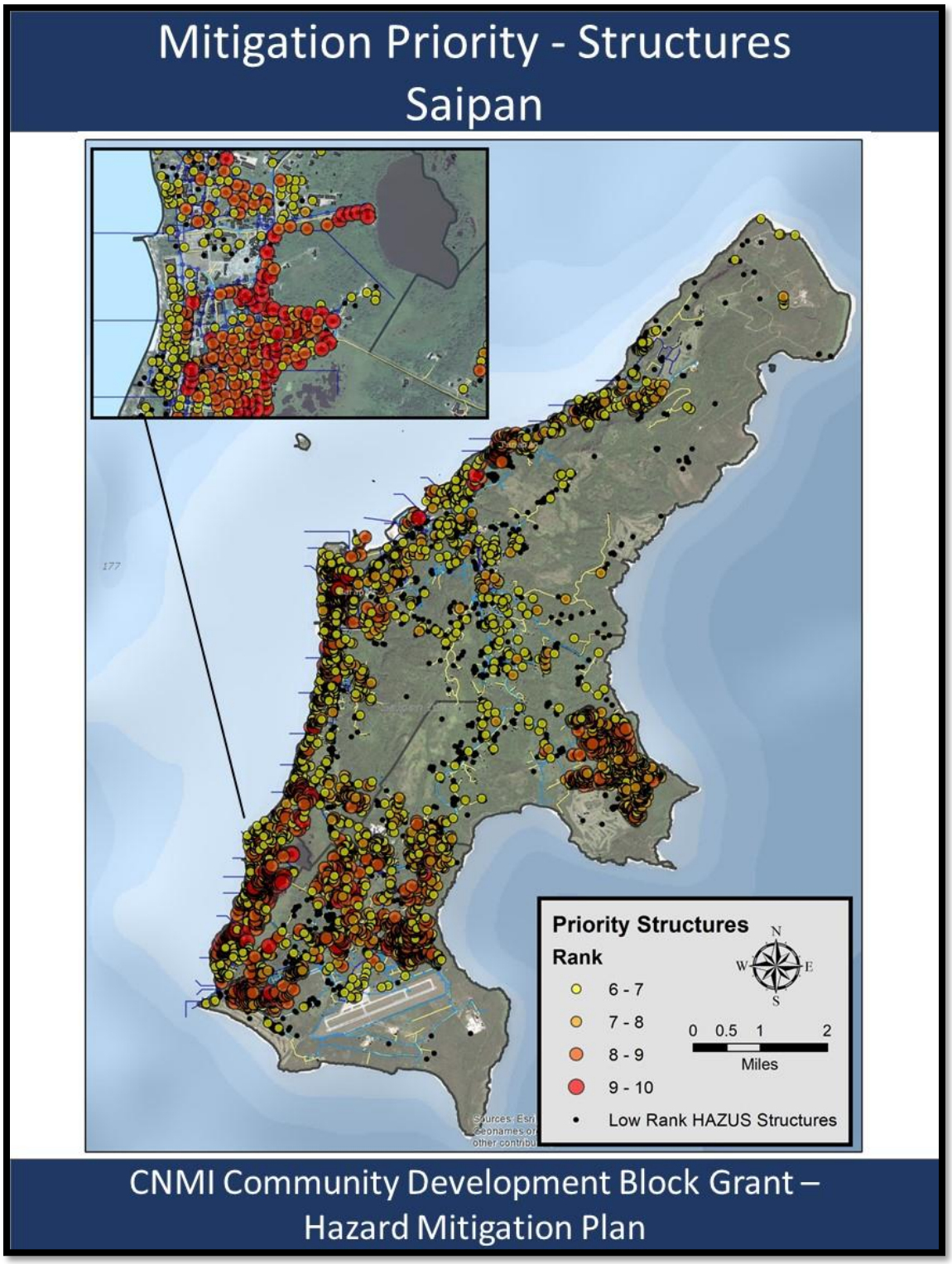
3.2.5 Hazard Mitigation Priority Parcels and Infrastructure

Using the mapping output from the mitigation priority area identification process, it is possible to focus in on how the prioritization rankings overlap with specific properties, structures, and infrastructure systems. This step is critical in transitioning from a geographic analysis of mitigation priorities to an assessment of particular systems and associated features that can be targeted for CDBG-MIT actions. In the maps on the following pages (Figures 58-63), mitigation rankings have been extracted to the CNMI's parcel datasets and FEMA Hazus structural database. A brief discussion of priority parcels and structures follows.

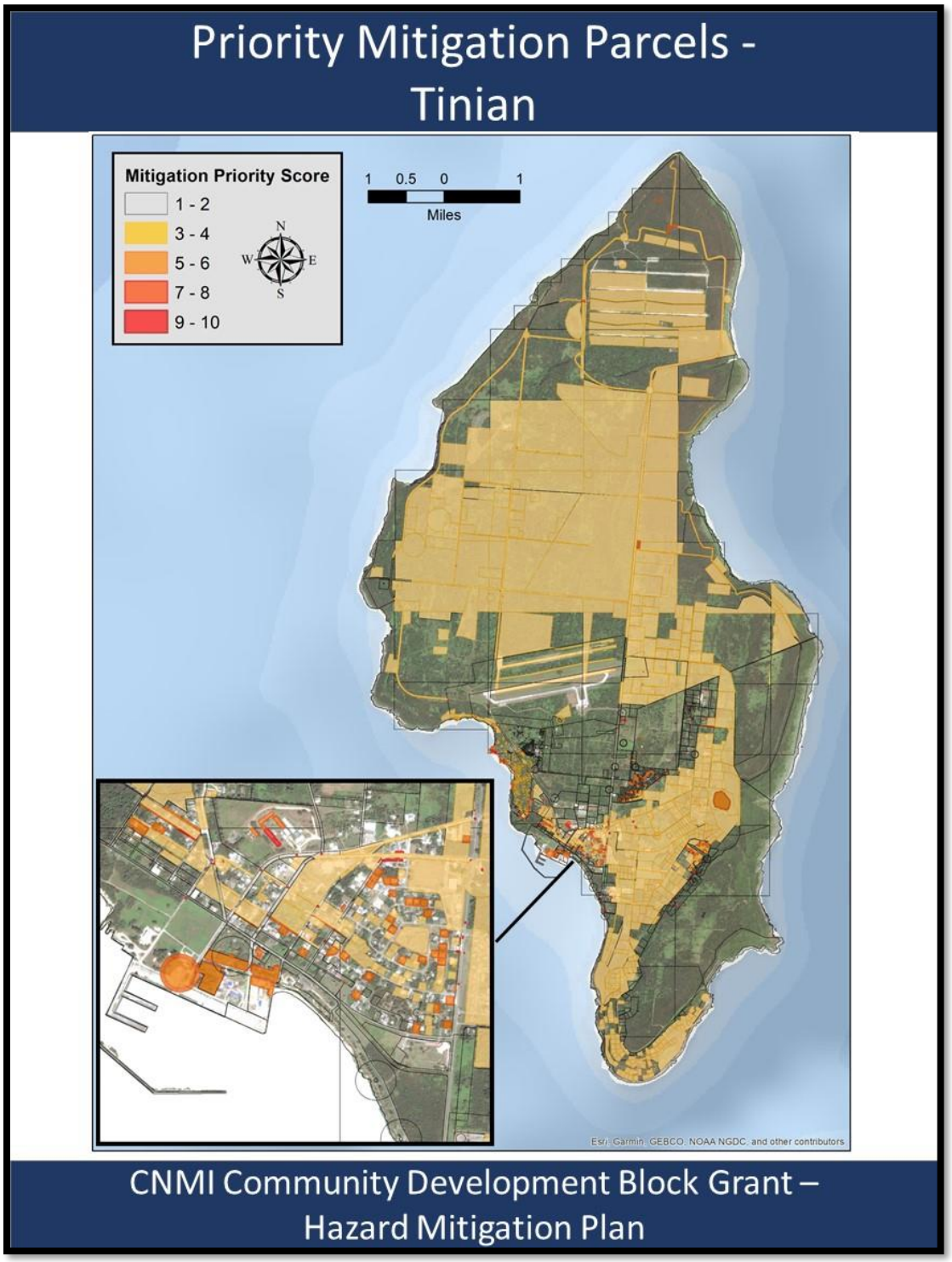
58: Mitigation Priority Parcels - Saipan



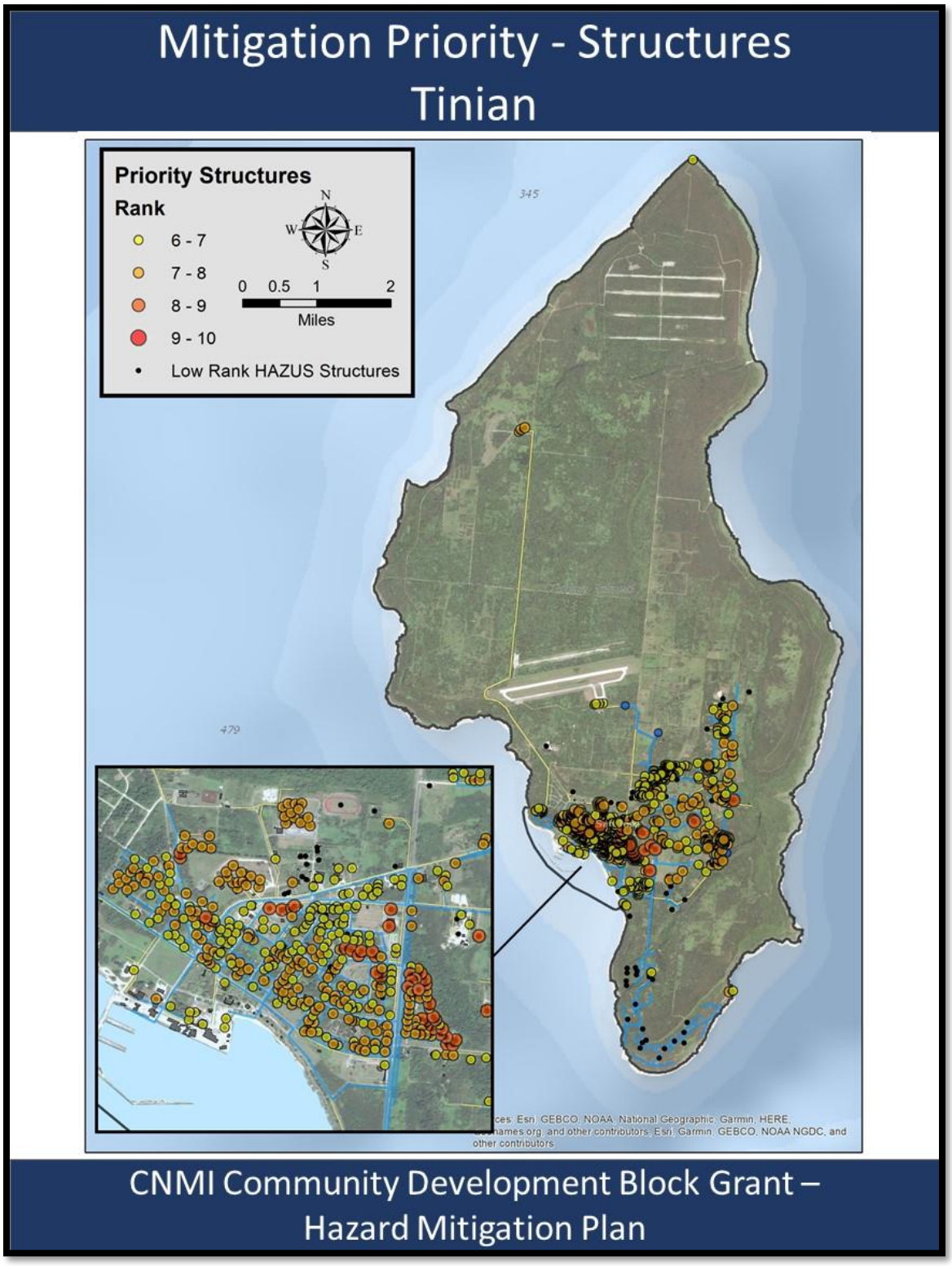
59: Mitigation Priority Structures - Saipan



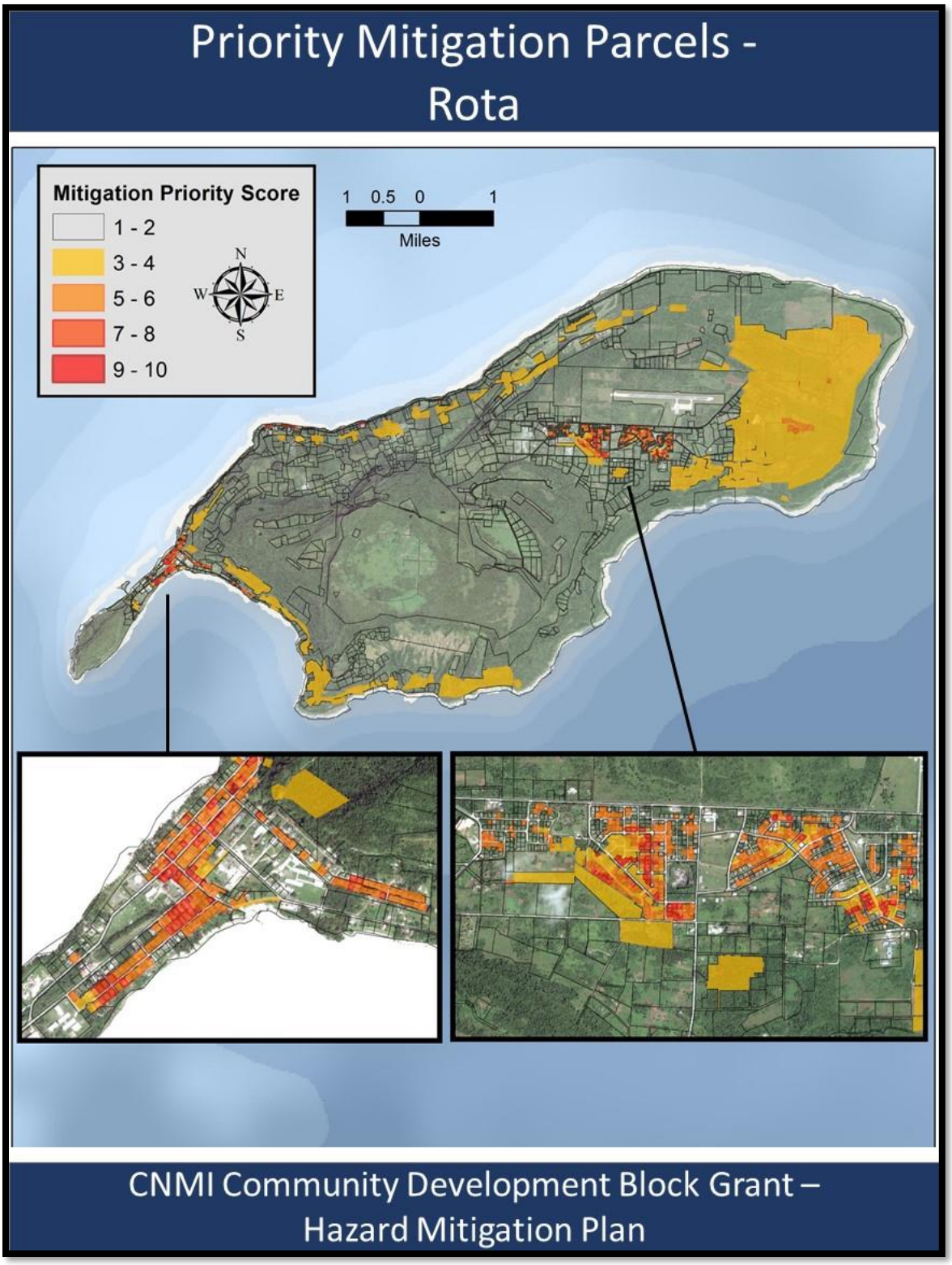
60: Mitigation Priority Parcels - Tinian



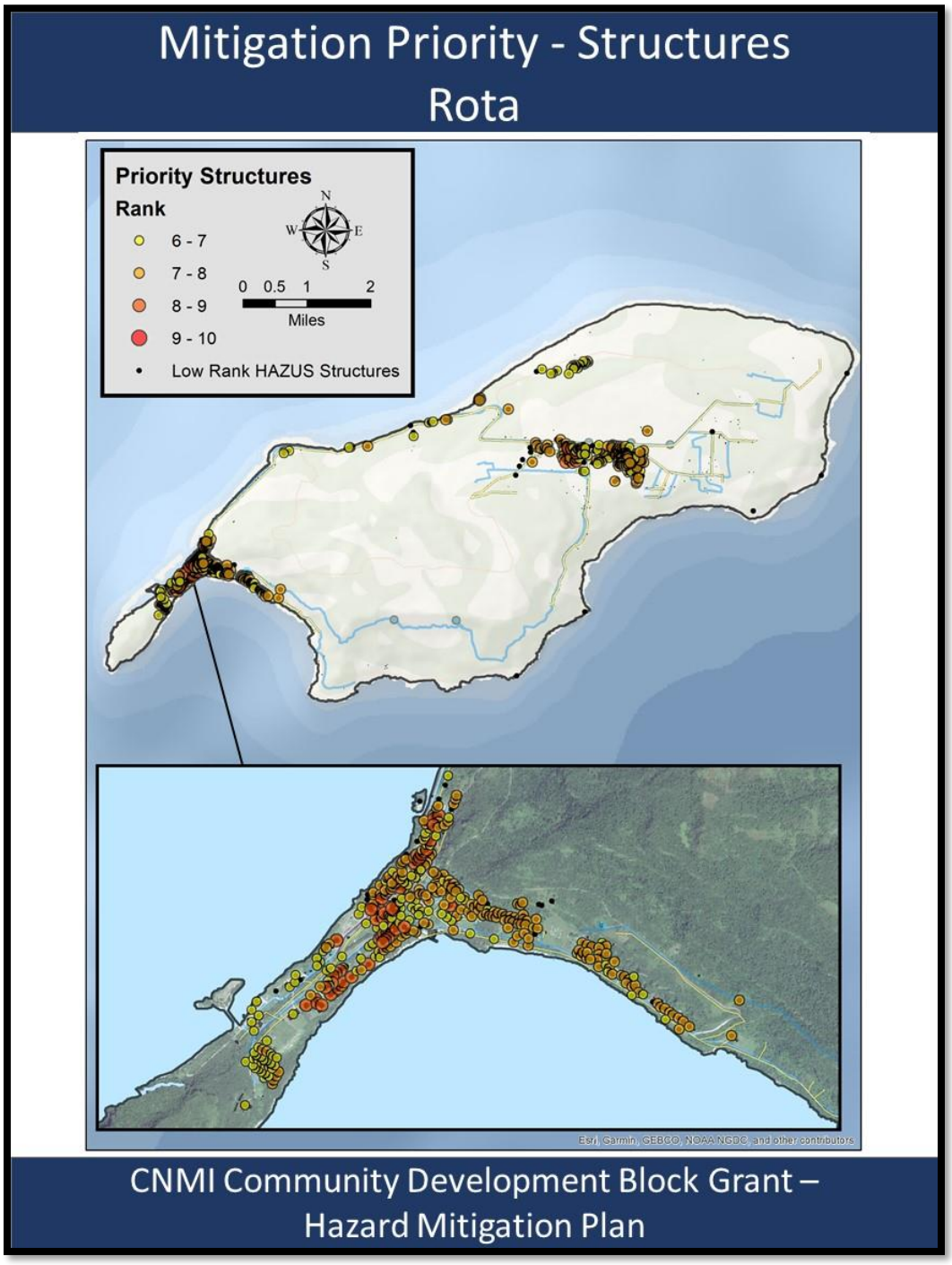
61: Mitigation Priority Structures - Tinian



62: Mitigation Priority Parcels - Rota



63: Mitigation Priority Structures - Rota



Saipan

On Saipan the highest ranked parcels and structures for mitigation provide some clear guidance on furthering hazard mitigation strategies. The energy and power infrastructure from Saipan's Port north through Lower Base face significant hazard exposure with respect to coastal flooding (particularly with future sea level rise factored in). Similarly, power, freshwater, stormwater, and

sewer infrastructure along the Beach Road corridor from Garapan to Oleai are characterized by high exposure to coastal flooding, while the road itself is at risk under some future climate scenarios. Further south, in the villages of Susupe and Chalan Kanoa, residential structures, transportation networks, and lifeline infrastructure for both power and water all rank highly, largely due to inland flooding and threats from extreme precipitation events.

In the areas around Kagman, Dandan, and San Vicente there are also high concentrations of resources and features that rank highly for mitigation. Of particular importance is the fact that population has grown in these areas between the 2010 and 2020 Census, and the consequent increase in residential demand on water and power infrastructure is not necessarily factored into this prioritization. With the added issue of expanding reliance on existing infrastructure, hazard mitigation actions in these three villages should be afforded extra consideration. The co-location of critical facilities, infrastructure, residential spaces, and extreme wind zones in these areas also lends additional rationale for focusing storm hazard mitigation there.

Tinian

Mitigation priorities identified on Tinian suggest a concerted focus on port facilities, schools/facilities in San Jose, and water systems linking from the Marpo Heights and Carolinas Heights area into San Jose.

While potential mitigation strategies and actions around Tinian Harbor would target coastal flooding hazards in particular, other components of storm-related hazards, including FEMA Special Wind Zones, should be addressed among proposed actions in the upland areas of Marpo Heights and Carolinas Heights. Critical water infrastructure in these areas is of particular importance due to its linkage to the rest of the residential, commercial, and industrial parts of the island. These features may gain additional importance with respect to mitigation in the future due to military activity and land leases on Tinian. Implications from Department of Defense actions could translate into shifting agricultural activities and potential loss of access to water and food for livestock, making reliable water supply on the southern third of Tinian a high priority.

Rota

On Rota, the highest ranking parcels and structures are once again concentrated in the Songsong and Sinapalo areas. However, many of these highly ranked features are associated with residential housing, particularly in Sinapalo. Due to this action plan's focus on infrastructure, mitigation actions should likely be concentrated in Songsong, where transportation, port facilities, and the water distribution network intersect directly with hazard threats, and are in some ways more vulnerable due to system isolation. For example, all of Songsong relies on potable water supplies from a single source and main distribution line. Likewise, all maritime operations and commercial port activities are in high-priority areas around Songsong, and any repetitive disturbance or impairment to the transportation network linking the northwest end of Songsong to the rest of the island could pose serious issues in the future.

This geographic assessment of mitigation priority areas and features constitutes an important component of further screening of potential mitigation projects and strategies. Results of these analyses are factored into the action plan as any proposed activity targets areas that rank in the upper 50% of mitigation priorities. The outcomes of this exercise were used in tandem with mitigation action priorities derived from the SSMP, as well as more recent, collaborative

planning initiatives (e.g. FEMA RiskMAP; CNMI Comprehensive Sustainable Development Plan) to narrow in on appropriate projects for CDBG-MIT funds. The remainder of Section 3, as well as Sections 5 and 6 of this action plan discuss the additional criteria, considerations, and coordination that have guided proposed uses of CDBG-MIT resources.

3.3 Hazard Mitigation Actions

Priority hazard mitigation actions in the CNMI have been updated and refined through several inter-agency planning processes over the last decade, particularly in the context of the FEMA-mandated state hazard mitigation plan efforts and CNMI Capital Improvements Program. These refined priorities are taken into consideration in the development of strategies in this action plan.

In the 2010 CNMI SSMP, hazard mitigation activities were grouped according to six mitigation action types: prevention, property protection, natural resource protection, emergency services, structural, and public information. For the 2014 SSMP, four new categories were created to streamline priority ratings for submitted actions and to identify key focus areas at a higher level: shelters, critical infrastructure and key resources, facilities, and other (e.g., warning systems, communications, mapping systems, health and safety maintenance programs, public education and outreach, etc.)

HSEM staff collected, reviewed, and categorized all submitted hazard mitigation actions into the four categories. Members of the Statewide Emergency Response Commission were tasked with scoring projects within each of the categories on a scale of 1 – 4 to indicate priority in terms of how critical the project is: 1 = critical, 2 = important, 3 = moderately important, 4 = low priority. A total of 10 scoring sheets were sent out; 7 were completed and received. Members that were non-responsive were advised that, in the interest of time, their input in the prioritization process would be invalid. The results were as follows (from Critical to Low Priority):

1. Shelter Hardening and Retrofitting
2. Critical infrastructure and Key Resources
3. Facilities
4. Others

Significant changes were also made to the specific hazard mitigation actions proposed in the 2014 SSMP update. During meetings with various agencies, it was apparent that a large amount of historical knowledge and experience with the previous SSMP update process and hazard mitigation planning in general was lost between the completion of the 2010 plan and the update for 2014. Employee turnover at different agencies and the shifting of plan maintenance from contractors to HSEM were contributing factors to these planning deficiencies, including the minimal changes made to plan components such as Loss Estimates, the FAM, and the CVA. In order to move forward and complete the update of the SSMP, participants in the update decided collectively to create a new set of hazard mitigation activities.

In May 2014, FEMA Region IX provided technical assistance to HSEM and facilitated discussions with CNMI stakeholders over a range of topics concerning the plan update. Specific care was given to the development of new hazard mitigation actions. FEMA staff guided participants in identifying activities allowable under Hazard Mitigation Assistance (HMA) Programs, crafting strong justifications for projects, prioritizing identified projects, and identifying possible sources of funding. Subsequently, HSEM staff held a follow-up meeting in June 2014 for agencies that were not present during the May Technical Assistance visit and to collect updates from participants that

had attended. The result of these planning steps was a new set of mitigation actions from over 13 different government agencies across all 4 CNMI municipalities, as well as the American Red Cross.

Some of the mitigation actions derived from the 2014 comprehensive SSMP update have either been funded or implemented in the wake of Typhoon Soudelor, while many others filtered into the 2018 SSMP update (see Appendix Y of the 2018 SSMP), and consequently more recent mitigation and recovery programs. In many instances priority actions from the 2018 SSMP are now in the process of being implemented through CNMI's Disaster Recovery programs and hazard mitigation program, or through assistance from the U.S. Department of the Interior – Office of Insular Affairs. Similar actions were removed from consideration in this action plan to avoid duplication of benefits.

The remaining mitigation priority actions and planning projects that were considered during this planning process meet the following conditions, and are detailed in **Appendix A** of this action plan:

- Carefully vetted with multiple CNMI agencies through both the SSMP and Disaster Recovery planning processes;
- Focused primarily on mitigation for specific infrastructure and lifeline utility systems
- Meet CDBG-MIT National Objective #1 (Benefit to LMI Populations)
- Address one of the top two project priorities in the CDBG-MIT scoring criteria (Section 6.2)
- Have yet to be funded and implemented.

Appendix B highlights a subset of this list of mitigation actions and planning projects (Appendix A), alongside the community lifelines, CDBG-MIT National Objective for LMI, and CDBG-MIT project scoring priorities (figure 74) that each of the actions and projects address.

From that list, several projects not only meet the screening criteria described in this action plan, but coincide with priority areas and systems that have ranked highly for mitigation (Section 3.2). These could potentially serve as mitigation activities funded through this action plan. The original list was derived from consultation with the CNMI Capital Improvements Program (Figure 64).

64: Potential Mitigation Actions Not Yet Implemented

Island	Project	Project Description	Estimated Cost (USD)	Duration
Mitigation Actions				
Saipan	Beach Road Improvement Project	Flood control and drainage project.	10,626,457	36 mos.
Saipan	Lower Base Road and Drainage Improvement	Improve the drainage system at Lower Base area.	2,152,000	19 mos.
Tinian	Replacement of the Tinian Carolinas Village 0.50 MG Water Tank	To improve the water capacity for the island, and replace existing welded tank with more resilient concrete structure	5,180,000	27 mos.
Saipan	Replacement of the Dandan Water Tank	There is a current risk of catastrophic failure of the water tank if another typhoon will hit area. Therefore, the objective of this Hazard Mitigation Grant	7,048,000	24 mos.

		application will be to replace the current tank		
Saipan	Replacement of the Kagman Water Tank	There is a current risk of catastrophic failure of the water tank if another typhoon will hit area. Therefore, the objective of this Hazard Mitigation Grant application will be to replace the current tank	7,141,000	24 mos.
Saipan	Power Plant #1 Facility Repair and Mitigation	To Harden Power Plant #1	4,987,427	18 mos.
Saipan	Kagman Community Shelter Project	Provide safe, secure and habitable long term-shelters for displaced residents during future typhoons and other natural disasters.	1,258,705	24 mos.
Mitigation Planning Projects				
Saipan	Assessment of Risk, Vulnerability and Disaster Bonding/Insurance Feasibility to Support Comprehensive Sustainable Development Planning and Disaster Risk Reduction	This project will support the Office of Planning and Development (OPD) in its mission to provide data-driven analysis, tools, and policies that support comprehensive sustainable development plan (Comprehensive Plan) for CNMI that ensures smart, safe development occurs.	807,380	24 mos.

Based on SSMP project priorities from 2010 through 2018, the most recent inventory of disaster recovery and mitigation projects obtained in consultation with CNMI CIP (Appendix A; subset in Figure 64), and the prioritization analyses conducted for this action plan, the following broad strategies are recommended to achieve the most effective mitigation efforts. It is important to note that many individual mitigation activities that fall under the following broad strategies are already underway, therefore continued coordination and consultation with the entities discussed in Section 5 (Coordination) will be necessary to avoid duplication of benefits:

- **Coastal flood mitigation:** Coastal flood mitigation measures can be taken through both planning and project implementation. Focal points for implementing flood mitigation efforts include Lower Base, Garapan, and Beach Road on Saipan, Tinian Harbor, and Songsong Village on Rota. All coastal flood mitigation targets would benefit from specific flood hazard studies that are inclusive of site-specific design and engineering recommendations. The completion of FEMA's current RiskMAP process will provide important baseline data to build off of. One such effort has already been approved for funding in the Garapan urban core. Given the concentration of critical infrastructure in Lower Base and the combination of both inland and coastal flood hazards in that area, Lower Base ranks highly among flood mitigation priorities after Garapan. Of specific concern is the transportation network and access roads in Lower Base, and the new transportation authority headquarters adjacent to the CUC power plant.

- **Inland flood mitigation:** Beyond those low-lying coastal areas threatened by coastal floods, the villages of Susupe and Chalan Kanoa are also very prone to flooding, particularly after heavy precipitation events. Flood mitigation in the form of drainage improvements and sewer/stormwater upgrades in this area should be a priority, especially given the high population density, concentration of community assets, and lack of adaptation options for residents (e.g. no immediate options for relocation).

- **Facility and infrastructure retro-fitting or hardening to meet special wind hazard ratings:** Following an inventory of critical facilities and infrastructure that have already been retro-fitted or replaced to meet higher wind speed ratings, remaining infrastructure (particularly those structures located within higher ranked extreme wind zones) should be upgraded to meet new standards in accordance with FEMA Special Wind Region guidance. This is particularly applicable for some of the aging freshwater distribution and storage infrastructure, which may be approaching the end of its lifespan following severe stress after recent typhoons. With growing populations in Kagman and Dandan (relative to other villages), water infrastructure in these villages should be prioritized.

- **Enhance coastal protection of transportation network and low-lying infrastructure through use of nature-based and/or hybrid solutions for flood hazard mitigation:** For the CNMI these actions include enhancing wetland capacities for stormwater retention, retro-fitting drainage systems with bioswales and other natural infrastructure, restoring living shorelines, building and restoring protective coral reefs, and exploring the use of mangroves in appropriate shoreline locations to reduce potential wave run-up from storms.

  In particular, improvement of natural drainage features along Beach Road and in Lower Base on Saipan would facilitate flood mitigation for critical infrastructure in the area. Likewise, restoration of coral reef site that have been identified by multiple CNMI partners as critical for coastal protection would enhance coastal defense along Saipan's western shoreline and lagoon, as well as around Tinian Harbor.

  Planning projects would also benefit the expansion of nature-based infrastructure improvements, including more detailed analyses of high-priority sites for coral restoration (as a coastal defense measure), feasibility of mangrove and living shoreline designs adjacent to critical infrastructure and facilities in Lower Base, and planning for a more robust and inter-connected system of green stormwater infrastructure in priority mitigation areas (e.g. network of stormwater retention, bioswales, and other drainage/filtration features).

  These nature-based solutions can be more readily adopted and implemented for hazard mitigation if a standardized means of conducting cost-benefit analyses for non-structural projects is developed. Currently the CNMI (and many other jurisdictions) have not adopted a methodology for including these relatively new natural infrastructure improvements in a traditional cost-benefit framework. Given the interest in adopting natural infrastructure solutions from both federal and local government, this planning effort can be considered a critical step in evolving hazard mitigation with new types of solutions in the CNMI.

- **Develop data infrastructure and information management systems that are structured according to the National Response Framework, community lifelines, and CNMI government agency functions:** This planning strategy would involve a comprehensive data integration of various CNMI government agencies and community

organizations, resulting in a centralized system for managing infrastructure and facility data, monitoring mitigation needs among those assets, and coordinating disaster responses. Planning projects that fall under this strategy could result in comprehensive updates to the Commonwealth's infrastructure, critical facility, and building stock inventories, which are essential to the CNMI's ability to conduct fully-informed risk and cost-benefit analyses. This enhanced capacity for conducting cost-benefit analysis would also enable CNMI government agencies and partner organizations to more readily leverage compatible mitigation assistance, such as FEMA's Building Resilient Infrastructure and Communities (BRIC) program, while also streamlining feasibility studies such as those conducted by the U.S. Army Corps of Engineers.

- **Assess and pursue options for hazard and disaster insurance or bonding in the Commonwealth:** Given the damages and losses incurred in recent disasters it would be beneficial for the CNMI to explore the feasibility of hazard insurance or bonding, either through a voluntary basis, or within regulatory frameworks guiding commercial or industrial development. The CNMI began participation in the National Flood Insurance Program in 1993, yet there is minimal coverage in the Commonwealth. FEMA Region 9 Floodplain Management Specialists (FEMA 2021) note that this may be partially due to the rare instances of mortgages; however, greater study and outreach regarding potential benefits and expanding participation on a voluntary basis could benefit the community.

  The Commonwealth may also benefit from exploring parametric insurance options that would draw from a local fund to restore natural and hybrid hazard reduction infrastructure once a specific hazard parameter (e.g. wind speed, flood depth) is triggered. While identification of funds for this type of program may be a limiting factor, insuring natural hazard mitigation systems could provide an effective and rapid means for both recovery and restoration of hazard mitigation systems. This type of program is being successfully piloted on the Mexican-Caribbean coast, where economic activity within the tourism sector pays into funds that restore the protective function of coral reefs upon parametric triggers for hurricanes (InsuResilience 2020).

  Planning projects focusing on insurance and bonding options would directly align with the CNMI's Comprehensive Sustainable Development Plan and the planning processes within it (see Section 5 – Coordination).

3.4 Nature-Based Infrastructure and Mitigation

Traditionally, "gray" or "hard" infrastructure solutions — engineering projects that use concrete and steel— have provided the primary means of managing risk and mitigating hazard impacts in most communities. Seawalls and revetments have a long history of protecting coastal infrastructure in the Pacific Islands and elsewhere. Similarly, building materials in wildfire-prone areas have transitioned from wood to stone, steel, or composites as a standard mitigation practice. Although these approaches have proven effective in site-specific hazard mitigation efforts, there is increasing interest among federal, state, and local mitigation actors in leveraging natural processes to increase resilience.

Combining the traditional hard infrastructure with nature-based approaches can also provide an effective means for hazard mitigation that results in environmental, economic, and social co-benefits (The Nature Conservancy 2021). FEMA has become aware of nature-based infrastructure as viable and preferred hazard mitigation solutions and has expressed interest in

funding them through Hazard Mitigation Assistance (HMA) grants, among other types of assistance.

Although nature-based infrastructure (NBI) and solutions (NBS) are intended to enhance natural ecosystems to mitigate hazards, there is no standard definition and terminologies vary among sectors. Common definitions of NBI include:

- The U.S. Army Corps of Engineers (USACE) uses the term "Engineering with Nature," defined as, "the intentional alignment of natural and engineering processes to efficiently and sustainably deliver economic, environmental, and social benefits through collaboration".
- FEMA defines nature-based solutions as "sustainable planning, design, environmental management, and engineering practices that weave natural features or processes into the built environment to build more resilient communities" (FEMA 2020b)
- The Nature Conservancy defines nature-based solutions as, "project solutions that are motivated and supported by nature and that may also offer environmental, economic, and social benefits, while increasing resilience. Nature-based solutions include both green and natural infrastructure."

A common thread among the definitions is that NBI provides a greater value than single-purpose gray infrastructure to result in both community and ecosystem benefits, and overall enhanced resilience of the site or resource in focus.

Currently several NBI studies and plans are underway to provide greater shoreline stabilization and coastal defense along Beach Road, Saipan, restore mangrove habitat for storm wave attenuation and stormwater filtration around Lower Base and American Memorial Park, and restore coral reef sites offshore from Garapan to curb potential coastal inundation. Expanding these pilot projects to other priority areas, as identified in Section 3.2, could provide substantial mitigation benefits with comparatively low maintenance and implementation costs. Figure 65 highlights a range of NBI options relevant to the CNMI, installation and maintenance costs, and implementation considerations. See *NOAA OCM 2020* for additional NBI cost estimates and considerations.

65: Costs and Considerations for nature-based mitigation solutions

Nature-Based Solution	Average Cost	Maintenance Cost	Cost Considerations
Stormwater – Rain Garden	$5-$16 per sq. ft.	$0.31-$0.61 per sq. ft.	Design, engineering, permitting, natural materials, installation, maintenance (watering, litter removal, clearing flow pathways twice per year and after storm events).
Stormwater - Bioswales	$5.50-$24 per sq. ft.	$0.06-$0.21 per sq. ft.	
Stormwater – Vegetated Filter Strips	$0.03-$3.00 per sq. ft.	$0.07 per sq. ft.	
Permeable Pavement – Porous Asphalt and Concrete	$5.50-$12 per sq. ft.	$0.09-$0.23 per sq. ft.	Design, enginnering, permitting, materials, installatation. Maintenance including sweeping and maintaining soil under

			pavers to allow for infiltration.
Coastal Protection – Coral Reef Restoration	$0-$25 million per acre (situation dependent)	N/A	Ecological baseline assessment, design, permitting, coral stock and substrates, labor, monitoring, maintenance of stock supply (e.g. nursery)
Coastal Protection – Mangrove Restoration	$12,500 per acre to restore hydrologic flow	N/A	Ecological baseline assessment, design, permitting, restoration materials, light equipment, labor, monitoring, and maintenance to include controlling pollution and invasive species, maintaining sediment supply, and accommodating wetland migration onto adjacent land.
Shorelines – Vegetation/Living	$68-$113 per linear ft.	Less than $100 per linear ft. annually	Ecological baseline assessment, design, engineering, permitting, installation, monitoring, and maintenance to include invasive plant control, periodic re-plantings following major disturbances.
Shorelines – Living plus Structural	$117-$603 per linear ft. (dependent on structural options)	Less than $100 per linear ft. annually	
Shorelines – Hardened/Structural	$457-$966 per linear ft/ ($125 for vinyl bulkhead to $1,952 for seawall)	$100 to >$500 per linear ft.	Repair or complete replacement of the hardened shoreline when damaged by a storm event or erosion (see Smiling Cove Marina restoration on Saipan)
Beach Nourishment	$1.1 million per mile (construction and maintenance)	$1.1 million per mile (construction and maintenance)	Ecological baseline assessment, design, engineering, permitting, materials, equipment lease for grading, monitoring and maintenance including sand source for renourishment, removal of invasive vegetation/restoration of native shoreline vegetation.

A planning project to assist in placing these types of options within a standard cost-benefit analysis framework, thus enabling more efficient leverage of various federal funding streams is recommended.

3.5 CNMI Smart, Safe Growth Criteria

As CDBG-MIT strategies and activities move into the implementation phase, any project will be passed through the lens of "Smart, Safe Growth" (Nimbus Env. 2018) prior to implementation. Smart, Safe Growth is a set of sustainable development guiding principles that have been adopted to facilitate the CNMI's Comprehensive Sustainable Development Plan. With support from FEMA and the EPA, the CNMI Office of Planning and Development is currently finalizing screening tools that can be used to vet projects during the development stage to ensure they meet criteria for (a) effective hazard mitigation, (b) climate change adaptation, and (c) smart growth. The criteria pertaining to hazard mitigation are listed in Figure 66.

66: CNMI Smart, Safe Growth Screening Criteria

"CNMI Smart, Safe Growth (SSG) Checklist for Review of Planning / Project Documents – Government Facilities, Commercial, Residential "
Does the plan or project consider natural hazards and a changing climate and incorporate SSG principles to minimize vulnerability of identified risks?
Does the plan or project incorporate or consider the Standard State Mitigation Plan and Climate Vulnerability Assessments and include measures to reduce risks?
Has the plan or project been coordinated with the DPW to ensure compliance with Flood Damage Prevention Regulations? (CNMI Reg. Title 155-10.2)
Does the plan or project consider the selected SLR/SLC scenario SLR50_ONDTY as the basis for plan elements?
Has the plan or project been coordinated with the DPW Building Standards for Earthquakes and Tsunami? (CNMI Reg. Title 155-10.1 and Title 155-10.2)
Has the plan or project been coordinated with HSEM evacuation plans / requirements?
Has the plan or project been coordinated with DEQ regulations for Groundwater Management Zones?(CNMI Reg. Title 65-20)
a. Does the plan or project consider redundant / backup water systems?
Does the plan or project consider increased risk from wildfire and include SSG principles to lower the risk?
Does the plan or project consider impacts from volcanic activity and include SSG principles to minimize / mitigation risk
b. Does the project comply with DPW Building Standards for Earthquakes (CNMI Reg. Title 155-10.1)?
Does the plan or project consider retreating from areas of highest risk as identified in the SSMP or on BECQ's permitting website?

Does the plan or project consider retrofitting existing infrastructure in hazard-prone areas as identified in the SSMP or on BECQ's permitting website?
Does the plan or project consider locating new critical facilities outside high-risk zones as identified in the SSMP or on BECQ's permitting website?

4.0 PROGRAM DESIGN

During the formulation of the CDBG-MIT Action Plan and program activities, several objectives and requirements were considered and described next.

4.1 National Objectives

Federal statute authorizing the use of CDBG funds requires that one of the following three National Objectives is covered in order for a CDBG program or activity to be eligible for funding.

Benefiting Low-to Moderate-Income (LMI) Persons

(a) At least 50% of program expenditures benefit LMI persons
(b) Efforts meeting this objective show a benefit to all area residents (geographic area must be primarily residential and at least 51% LMI persons), focus on limited LMI clientele (such as elderly and homeless persons), address housing that will be occupied by LMI households, and job creation with 51% created or retained by LMI individuals.

Preventing or Eliminating Slum or Blight

(a) Efforts that meet this objective include: addressing slum/blight on an area basis
(b) This national objective has been removed, unless HUD grants a waiver.

The CNMI intends to meet the following National Objectives:

1. Benefitting Low- and Moderate Income (LMI) persons; and

2. Urgent Need in its implementation of the MIT Action Plan and programs.

The program also allows 5% of the funding allocation for Administration and up to 15% to be used for planning-related activities. These percentages of the funds are not required to address the National Objective mandate. However, 80% of the MIT funding must be used to address a National Objective.

Figure 67 highlights the only U.S. Census block groups in the CNMI that do not have at least 51% of the population qualifying as LMI persons. These figures are derived from the last census-based LMI calculations for CNMI on the HUD Exchange (https://www.hudexchange.info/programs/census/state-data/). These block groups are concentrated within the villages of Capital Hill and Navy Hill on Saipan, both of which fall outside of the priority mitigation areas and project footprints that have been identified in this action plan. It is important to note that the 2020 U.S. Census detailed demographic data for the CNMI and other Island Areas is scheduled for release in 2022, and will enable new calculations of LMI populations, per methodology described in HUD's calculation process for the low-to-moderate income level.

67: CNMI census block groups with less than 51% LMI persons (source: HUD Exchange)

Island	Village	Percentage LMI
Saipan Municipality	Navy Hill CDP	38.3
Saipan Municipality	Capital Hill CDP	42.2
Saipan Municipality	Navy Hill CDP	46.1

Saipan Municipality	Capital Hill CDP	46.5
Saipan Municipality	Capital Hill CDP	50.4

None of the mitigation actions or planning projects that are described or recommended within this action plan directly focus on the villages of Navy Hill or Capital Hill, or have a limited connection to those villages (e.g. through power feeder or water distribution network). Therefore, all populations that will benefit from CDBG-MIT projects and actions can be assumed to meet the LMI National Objective. The consideration of low-income and socially vulnerable households within the mitigation prioritization framework used in this action plan also helps to ensure that this National Objective is achieved.

4.2 Leveraging Financial Resources (Federal and Local)

The CNMI is fully cognizant about the importance of maximizing the value of limited financial resources. Aptly, the CNMI has made it a priority to leverage multiple sources of funding, whenever possible, to support the greatest potential hazard mitigation benefits. This includes prioritizing projects in which other Federal, State, and Local funding sources can be leveraged to allow CDBG-MIT funding to pay only a portion of project costs. This approach will allow the CNMI to utilize limited CDBG-MIT funding to support a maximum number of projects and programs. As provided within the CNMI's Standard State Mitigation Plan (2018), the CNMI pursues and utilizes a number of resources to advance critically important hazard mitigation projects.

4.3 Reasonable Costs

The CNMI will review all program costs to ensure that they are cost-reasonableness. This will ensure that funds are expended efficiently and effectively. The determination of cost reasonableness will cover any project or program funded by CDBG-MIT funds, including grant awards to individual property owners or businesses as well as administrative and planning funds. The CNMI will use the cost principles described in 2 CFR Part 225 (OMB Circular A-87) to determine necessity and reasonableness. Per 2 CFR Part 225, "A cost is reasonable if, in its nature and amount, it does not exceed that which would be incurred by a prudent person under the circumstances prevailing at the time the decision was made." The CNMI will follow these principles and fund only project costs that are deemed necessary and reasonable.

4.4 Construction Standards

1. The CDBG-MIT proposed projects and programs will adhere strictly to the construction and design standards developed for the CDBG-DR program. These standards detail the methods, materials, and requirements for all projects including but not limited to:
    - **(i)** **Health and Safety** - identifying all life-threatening deficiencies that must be addressed immediately if the housing is occupied [24 CFR 92.251(b)(1)(i)]
    - **(ii)** **Major systems** – requiring that, upon project completion, each major system, as defined in 24 CFR 92.251(b)(1)(ii), had a remaining useful life of a minimum of 5 years, or for a longer period as specified by the NMHC, or the major system was rehabilitated or replaced as part of the rehabilitation [24 CFR 92.251(b)(1)(ii)]

(iii) **Lead-based paint** [24 CFR 92.251(b)(1)(iii)]
(iv) **Disaster mitigation (if applicable)** – requiring the property to meet the disaster mitigation requirements [24 CFR 92.251(b)(1)(vi)]
(v) State and local codes, ordinances and zoning requirements [24 CFR 92.251(b)(1)(vii)]
(vi) Minimum deficiencies that must be corrected based on inspectable items and areas in HUD's Uniform Physical Condition Standards [24 CFR 92.251(b)(1)(viii)]

2. These standards also take into close consideration the Green Building Standards, the 2018 International Building Code, and the Tropic Energy Code. In addition, all project design will take into account the CNMI's Seismic Zone "D" and Wind Exposure "D" category designations.

4.5 Elevation Standards

At this time, the CNMI will not provide funding assistance (i.e. minor rehabilitation, major rehabilitation, or new construction) to properties located in a floodplain but if NMHC does decide to provide such assistance in the future, for all new construction projects, elevation standards will be applied so that the lowest floor is at least 2 feet above the 1 percent annual floodplain elevation.

4.6 Green Building Standards

The CNMI does not anticipate any projects being supported by CDBG-MIT funds that cover housing-related projects. However, the CNMI recognizes conformance with FR 81, No. 117 (June 17, 2016) which require Green Building Standards for substantial rehabilitation, the construction of new housing or replacement housing should it decide to pursue residential efforts.

If applicable, the NMHC CDBG-MIT program will implement construction methods that emphasize quality, durability, energy efficiency, sustainability, and mold resistance. All elevation-eligible structures 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 CDBG will require that all applicable construction meets an industry-recognized standard that has achieved certification under at least one (1) of the following programs:

1) ENERGY STAR (Certified Homes or Multifamily High-Rise), including EPA Indoor AirPlus,
2) Enterprise Green Communities,
3) LEED (New Construction, Homes, Midrise, Existing Buildings Operations and Maintenance, or Neighborhood Development),
4) ICC–700 National Green Building Standard, or
5) Any other equivalent comprehensive green building program acceptable to HUD.

CDBG will identify which Green Building Standard will be used in the program policies and procedures, as per HUD requirements.

Where feasible, CDBG 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.

4.7 Protections

4.7.1 Protected Classes and Vulnerable Populations.

The CNMI is committed to protecting vulnerable populations and prohibiting discrimination based on race, color, national origin, religion, sex, sexual orientation, familial status, and disability. In the delivery of the CDBG-MIT grant, the CNMI shall strive to ensure that MIT activities benefit all CNMI residents and not negatively impact vulnerable or protected classes of people.

Screening was conducted within this plan's mitigation needs assessment and risk prioritization to ensure that vulnerable populations were included as a component of MIT project identification. The methodology for integrating considerations of protected classes and vulnerable populations is detailed in Sections 2 and 3 of the plan.

4.7.2 Accessibility Requirements.

The CNMI shall comply with all accessibility standards, as mandated by the Americans with Disabilities Act, in the delivery of CDBG-MIT projects and activities.

4.7.3 Addressing Displacement

The CNMI does not expect that CDBG-MIT projects and activities will result in the displacement of persons or entities. Nonetheless, if future actions are pursued with CDBG-MIT funds which may result in such impact, then the CNMI will strive to minimize or mitigate the displacement of persons or entities in accordance with acquisition and relocation requirements as prescribed in the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (URA), as amended, and implementing regulations at 49 CFR Part 24, except where waivers or alternative requirements are provided for this grant.

4.7.4 Disaster and Hazard Resistant Housing for All Income Groups

The CNMI does not intend to pursue any housing-related projects or activities with CDBG-MIT funds.

4.7.5 Assistance for Homeless, Low-Income, and Vulnerable Populations

The CNMI does not intend to pursue housing or social services related projects or activities with CDBG-MIT funds specifically aimed towards assisting the homeless, low-income individuals, or other vulnerable populations. The efforts anticipated to be implemented with MIT funding substantially draw from the SSMP that have an area-wide benefit and are considered infrastructure and studies that build a more resilient CNMI public infrastructure.

5.0 COORDINATION AND CONSULTATION

The NMHC has pursued a collaborative approach in recent coordination and consultation efforts with and between governmental entities, non-governmental entities, communities, and the various industries within the CNMI. Of primary concern during initial consultation efforts were discussions surrounding alterations and/or upgrades to critical infrastructure, which would yield more impactful outcomes and would be more likely to create solutions that meet the needs of the communities within the CNMI in the long-term. However, all potential mitigation actions that were brought forth by the stakeholders listed below were/are considered in this mitigation action planning process.

5.1 Stakeholders

It is understood that HUD requires grantees to conduct consultation and to coordinate with various governmental and non-governmental stakeholders. Ultimately it is people that must support strategy execution. Communications channels that enable two-way information sharing serve to increase awareness, build buy-in, and grow engagement. When implementing the adaptive management process, feedback from all stakeholders is critical to identifying challenges and crafting creative solutions in the “plan-do-check-act” strategic planning cycle. By reaching out to and involving a wide array of parties, NMHC will ensure a comprehensive approach is taken to hazard mitigation and planning. Following HUD guidance, NMHC has identified stakeholders that include the following general list of entities:

(a) Federal and State Agencies

(b) Local Governments

(c) Affected Parties in Geographic Area

(d) Indian Tribes

(e) Private Sector

(f) Non-Governmental Organizations

5.2 Mitigation Action Planning and Coordination

The CNMI conducted significant public outreach and included public input in the development of its 2018 SSMP, which along with NMHC’s CDBG-DR’s list of infrastructure projects which require mitigation, are the guiding documents on which the CDBG-MIT Action Plan programs are based.

The NMHC will continue to work with local, state, and federal agencies to coordinate and control functions for the CDBG-MIT program with NMHC and the various CNMI government departments and agencies implementing funded and eligible projects. These agencies include the Governor’s Office along with the Mayors of Saipan, Tinian and Rota as well as other officials, entities, and organizations from the community. This Action Plan has been reviewed by the Office of the Governor and will be adopted by the NMHC Board which is made up of representatives from Saipan, Tinian, and Rota, in addition to other stakeholders as this

arrangement enhances marketing and outreach efforts. NMHC will spend no more than 15% of its total allocation on eligible Planning activities. This includes all Action Plan development activities, which are considered planning activities. NMHC also intends to fund planning-only grants for studies, technical reports, and/or the like. This may include costs incurred for data gathering, studies, analysis, and preparation of plans. For the purposes of this grant award, the cost of engineering or architectural plans in support of construction activities will be treated as direct project delivery costs. Only NMHC can incur planning costs.

5.2.1 Existing Stakeholder Priorities for Mitigation

FEMA Risk MAP Discovery Process

CNMI government agencies and hazard mitigation partners are currently engaged in a multi-year flood risk mapping and technical assistance process led by FEMA. These agencies and local partners include NMHC, Office of Planning and Development, Office of Homeland Security and Emergency Management, Department of Public Works, Mayor's Offices, Bureau of Environmental and Coastal Quality, and Office of Management and Budget – Hazard Mitigation section. All of these partners will also remain engaged in the refinement and implementation of hazard mitigation projects supported by the CDBG-MIT program.

The flood risk mapping and assessment program (Risk MAP) was initiated with a discovery process in which existing flood hazard concerns were identified by numerous stakeholders, including some broad mitigation and adaptation actions or planning activities that could help alleviate these concerns. Figure 68 lists the outcomes of this initial discovery process. These mitigation needs are reflected in the broad mitigation strategies outlined and proposed in Section 3 of this action plan, and were taken into consideration during the selection of potential mitigation action and planning projects.

68: FEMA Risk MAP - Flood Mitigation Needs for CNMI

ISLAND	HAZARD	MITIGATION NEED
SAIPAN	COASTAL EROSION	Mitigate or adapt to erosion of Micro Beach. Coordinate across agencies to look at existing engineering studies or proposed nature-based solutions and determine next steps.
SAIPAN	FLOOD	Secure Lower Base Power Plant and access road from flooding.
SAIPAN	FLOOD	Ensure continued functionality of and access to Commonwealth Health Center during flood.
SAIPAN	FLOOD	Improve drainage of Garapan District.
SAIPAN	FLOOD	Protect/stabilize Beach Road, Beach Road Pathway, and adjacent infrastructure from coastal flooding and sea level rise.

SAIPAN	FLOOD, STORM-WATER	Improve building inspection and practices to reduce flooding from runoff. Stormwater improvements for Garapan and Tinian industrial area.
SAIPAN	FLOOD, SEA LEVEL RISE	Protect coral reefs and protective functions, given consideration to expected sea level rise.
SAIPAN	TYPHOON	Remediate debris, derelict, or abandoned buildings that could act as projectiles and exacerbate damages from strong winds.
TINIAN	MULTI-HAZARDS	Identify mitigation strategies to be included in the SSMP.
TINIAN	FLOOD, STORM-WATER	Improve building inspection and practices to reduce flooding from runoff.
ALL ISLANDS	MULTI-HAZARDS	Train workforce for enforcement of 2018 International Building Code.
ALL ISLANDS	MULTI-HAZARDS	Gain access to technical assistance or training on FEMA programs, including Environmental and Historic Preservation and the National Flood Insurance Program.
ALL ISLANDS	MULTI-HAZARDS	Improve resources for disaster-resilient building, like an update to the Homeowner's Guide or expanding on the CNMI Bureau of Environmental and Coastal Quality - Division of Coastal Resources Management's Better Building guidebook on stormwater and typhoon risks.
ALL ISLANDS	MULTI-HAZARDS	Engage with multiple agencies and local governments to identify mitigation strategies and update the Standard State Hazard Mitigation Plan.
ALL ISLANDS	FLOOD	Increase flood insurance options and policies, including participation in the National Flood Insurance Program.
ALL ISLANDS	FLOOD	Improve coastal flood hazard data and modeling for all islands to understand risks to flooding and to develop new Flood Insurance Rate Maps for Saipan, Tinian and Rota.
ALL ISLANDS	FLOOD	Improve coastal flood hazard data and modeling that includes hazards presented by wave run-up and sea level rise to be used in planning, development and identifying flood mitigation actions.
ROTA	MULTI-HAZARDS	Identify mitigation strategies to be included in the Standard State Mitigation Plan.

SAIPAN	MULTI-HAZARDS	Improve living conditions and safe housing for vulnerable residents and residents still recovering from or displaced by Hurricane Yutu.

CNMI Standard State Mitigation Plan

The 2018 update to the CNMI Standard State Mitigation Plan (SSMP) involved many different stakeholders in the CNMI who perform or who are involved in disaster mitigation activities. The full list of stakeholders and a description of the planning and coordination efforts taken in preparation of this planning document can be found in Sections 3.3 through 3.6 of the 2018 CNMI SSMP, located here. Given the existing disaster mitigation planning and statewide coordination structure/process that the SSMP provides, NMHC has utilized similar methodologies and means of information sharing/gathering in preparation of this CDBG Mitigation Action Plan.

CNMI Comprehensive Sustainable Development Plan

In 2018 the newly formed CNMI Office of Planning and Development (OPD) was tasked with drafting and promulgating the CNMI's first Comprehensive Sustainable Development Plan (CSDP). To craft the CSDP, OPD convened regular meetings with the Planning and Development Advisory Council (PDAC) to discuss current challenges, needs, and long-term objectives for the CNMI. The core values, themes, goals, and objectives of the CSDP included a number of mitigation elements, brought forward during PDAC meetings through the iterative process that involved multiple community meetings and survey comments. This NMHC Mitigation Action Plan will undergo review by the CNMI OPD for conformity with the CNMI CSDP's goals and objectives.

Capital Improvement Projects (CIP) Mitigation Projects

The CNMI Capital Improvement Program (CIP) is an office under the Office of the Lt. Governor which addresses a variety of infrastructure needs for the CNMI. The CIP office administers, implements and manages 702 Capital Improvement Projects funded under the US Office of Insular Affairs, which focus on critical infrastructure needs with regard to health, education, power, water, wastewater and solid waste. The CIP office maintains an ongoing list of mitigation projects at various stages of funding and development. This CIP mitigation project list is referenced throughout this NMHC CDBG Mitigation Action Plan.

CDBG Disaster Recovery Projects

In 2020, the NMHC CDBG Disaster Recovery Program Action Plan gained approval by HUD. In it, NMHC illustrates the planning and coordination efforts that were undertaken to arrive at a detailed Needs Assessment and subsequent breakdown of recovery projects by type, with general requirements expressed for each category of project. The NMHC CDBG Mitigation Action Plan list of mitigation projects were initially informed by this list, and later refined throughout the iterative coordination and consultation efforts with the pertinent CNMI stakeholders and their respective priorities for mitigation actions mentioned in the paragraphs above.

6.0 CDBG-MIT BUDGET AND PROGRAMS

6.1 CDBG-MIT Budget Summary

The CNMI intends to utilize CDBG-MIT funding to support multiple hazard mitigation programs and projects that will complement one another and lead to greater community resilience. CDBG-MIT funds shall be expended in accordance with Section II. of FR 45838 and FR 561, with funding made available for eligible activities related to the mitigation of risks within Most Impacted and Distressed (MID) Areas: the islands of Saipan and Tinian. In conformance with FR 561 a minimum of $8,112,500 of the total $16,225,000 allocated to the CNMI must be spent on mitigation projects located on the islands of Saipan and Tinian; CNMI's identified MID areas.

Table 6-1 summarizes the CDBG-MIT budget. HUD requires that 50% of the funds be expended within a six-year period and the entire 100% of the funds to be spent within a twelve-year period. The CNMI anticipates that it will be able to implement all CDBG-MIT programs within six years based on the design of these projects and as Figure 69 shows.

69: CDBG-MIT Budget Summary

Use of Funds	Budget	Expenditure Schedule					
		2022	2023	2024	2025	2026	2027
Infrastructure	$14,697,000	$1,460,250	$5,142,375	$5,142,375	$2,952,000	-	-
Planning Activities	$716,750	$81,125	$252,438	$252,438	$130,750	-	-
Administration	$811,250	$81,125	$283,938	283,938	$162,250	-	-

Infrastructure Projects

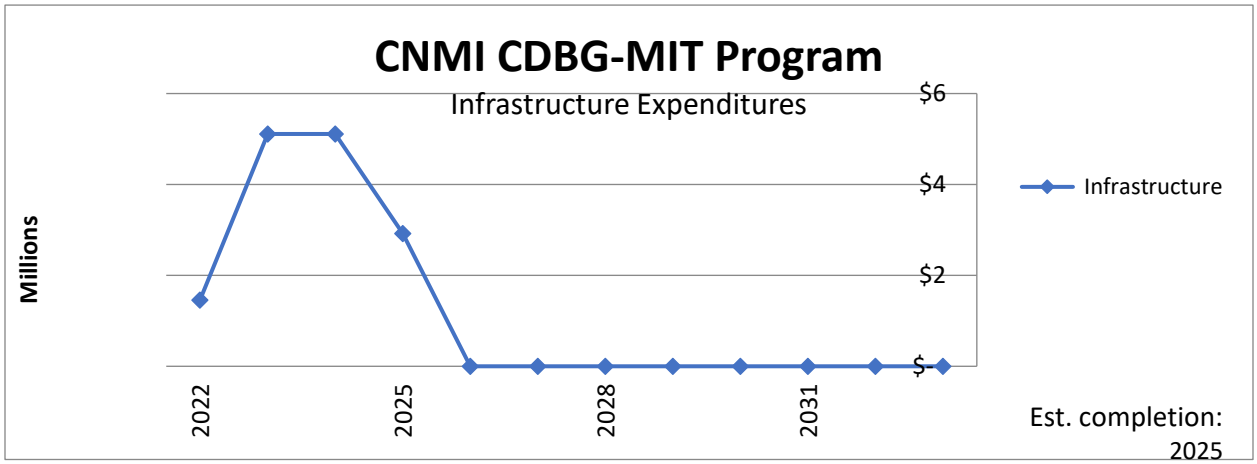
Based on the analyses conducted to identify priority mitigation areas, as well as mitigation planning processes that were incorporated into this action plan, several mitigation actions focused on infrastructure were identified. Once mitigation strategies and associated actions were screened to avoid duplication of benefits, the freshwater infrastructure in MID areas emerged as a top priority. This is particularly the case for water storage and piping that is at risk to catastrophic failure in the event of future tropical cyclones due to deteriorated materials. Potential water infrastructure projects should involve replacement of storage or distribution structures in areas serving high-percentage LMI populations, areas of growth, and locations within extreme wind zones. Replacement or enhancement of water infrastructure in these areas should also align with best practices in terms of resilient building materials, as well as adhere to design standards for structures in wind risk category IV, as defined in FEMA's special wind region study for the CNMI (2020).

Replacement and/or enhancement of freshwater storage and distribution infrastructure has a projected implementation and expenditure timeline of less than six years (figure 70). This condensed timeline is due in part to a relatively streamlined permitting and design process, as the infrastructure is pre-existing.

It is important to note that flood hazard mitigation in low-lying areas is still a serious concern and should remain a priority in the Commonwealth's hazard mitigation activities. That being said, hazard mitigation and disaster recovery projects that have been funded, or at least applied for, in the last three years address some of the higher priority areas, thus creating the potential for duplication of benefits. Flood hazard studies are also currently ongoing for the CNMI, both as a whole (FEMA Risk MAP), as well as for priority areas (Garapan). The results of these studies should be released first, and inform next steps in terms of mitigation.

In addition, CNMI stakeholders and partner agencies have demonstrated interest through several collaborative projects over the last couple of years in using nature-based hazard mitigation solutions to address flooding. In order to effectively address flood hazards through natural infrastructure, some means of standardized valuation and assessment of costs and benefits needs to be established first. This is addressed in the following summary of planning-oriented expenditures.

70: CDBG-MIT Expenditure Timeline - Mitigation Actions



Planning Projects and Administration

While mitigation actions focused on infrastructure and the freshwater community lifeline comprise the majority of the proposed CDBG-MIT budget, some funds should be focused on enhancing the Commonwealth's approach to mitigation in the form of planning projects. In particular, local agency partners and subject matter experts within the CNMI Office of Planning and Development have demonstrated interest in expanding the CNMI's mitigation toolkit, as opposed to simply funding more studies of hazard risks. Two planning concepts emerged as top priorities that have the potential to greatly reduce the economic impact of future disasters, while also enabling new mitigation actions that have lower material and maintenance costs.

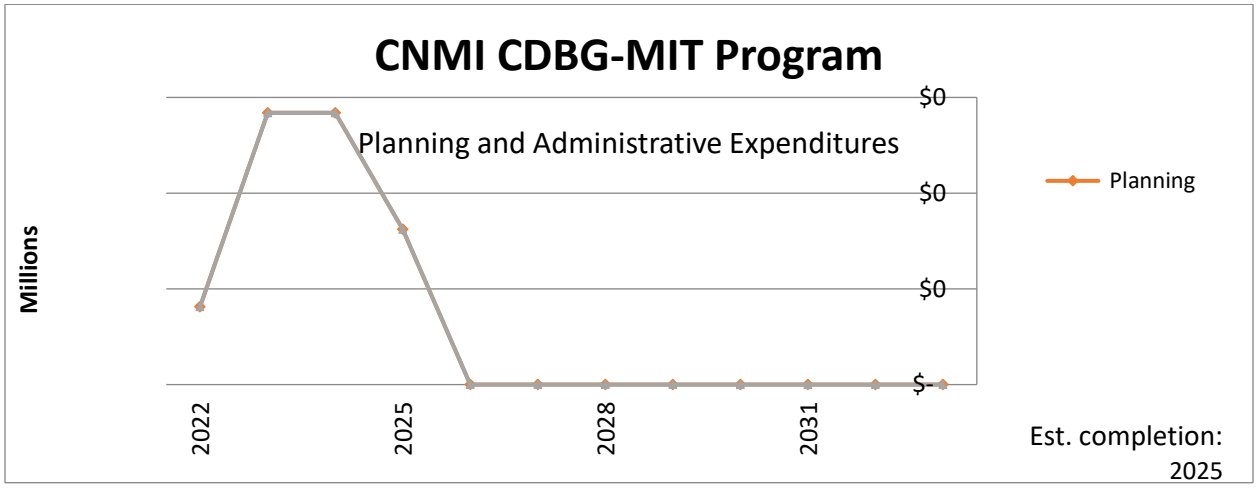
The concept of hazard and/or disaster insurance or bonding is relatively new in the CNMI, despite the community being a participant in the NFIP for over two decades. Given the waves

of development and investment that the CNMI has experienced on a cyclical basis for many years (and subsequent hazard impacts to those investments), the implementation of hazards or disaster insurance and bonding has great potential to benefit the Commonwealth overall. A comprehensive study, and possible pilot project, to assess the feasibility of insurance and bonding options could change the hazard mitigation landscape in the Northern Marianas for the better, and reduce future economic burdens post-disaster.

Another component of hazard mitigation planning that warrants attention and some improvement is cost-benefit analysis (CBA). While these analyses can be conducted in a fairly standardized manner for traditional mitigation measures and structures (e.g. FEMA's CBA plugin for Excel), there is no formal methodology or adopted guidance in CNMI for conducting a CBA for nature-based infrastructure (NBI) projects, such as coral reef restoration or erosion mitigation through living shorelines. Numerous federal, state, and local agencies have been publishing broad guidance and planning principles for NBI, yet estimates on both costs and benefits are characterized by such a wide range of figures that these guidance tools may not be helpful in a local context. A planning project to generate locally-relevant estimates for NBI costs and benefits, and an associated CBA tool, would provide a means for the Commonwealth to more easily justify nature-based and hybrid mitigation projects, which local partners have begun implementing on a more opportunistic basis.

These planning projects are projected to take no more than five years, with the majority of work completed within the first three years (Figure 71).

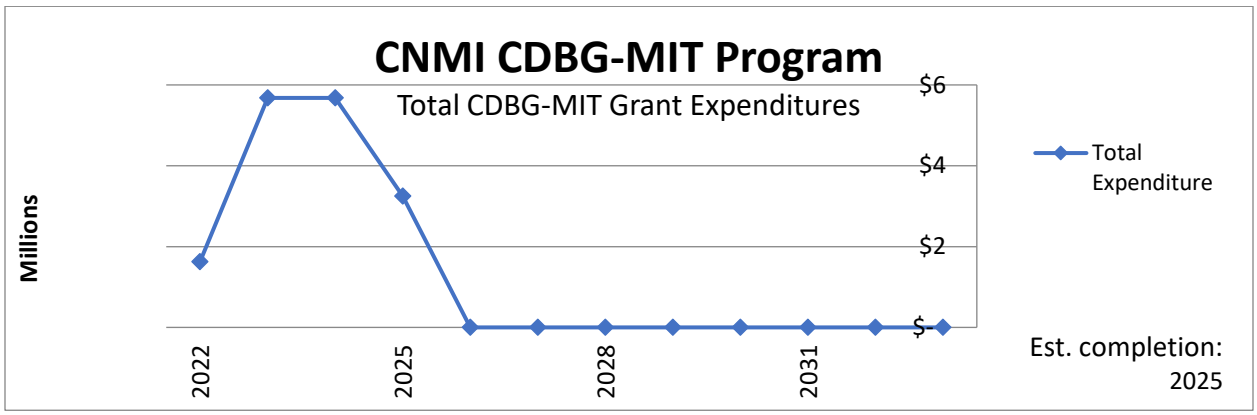
71: CDBG-MIT Expenditure Timeline – Mitigation Planning Projects



Total CDBG-MIT Expenditures

Figure 72 illustrates the expenditure timeline for all CDBG-MIT Action Plan projects and activities.

72: Expenditure Timeline for full CDBG-MIT Program

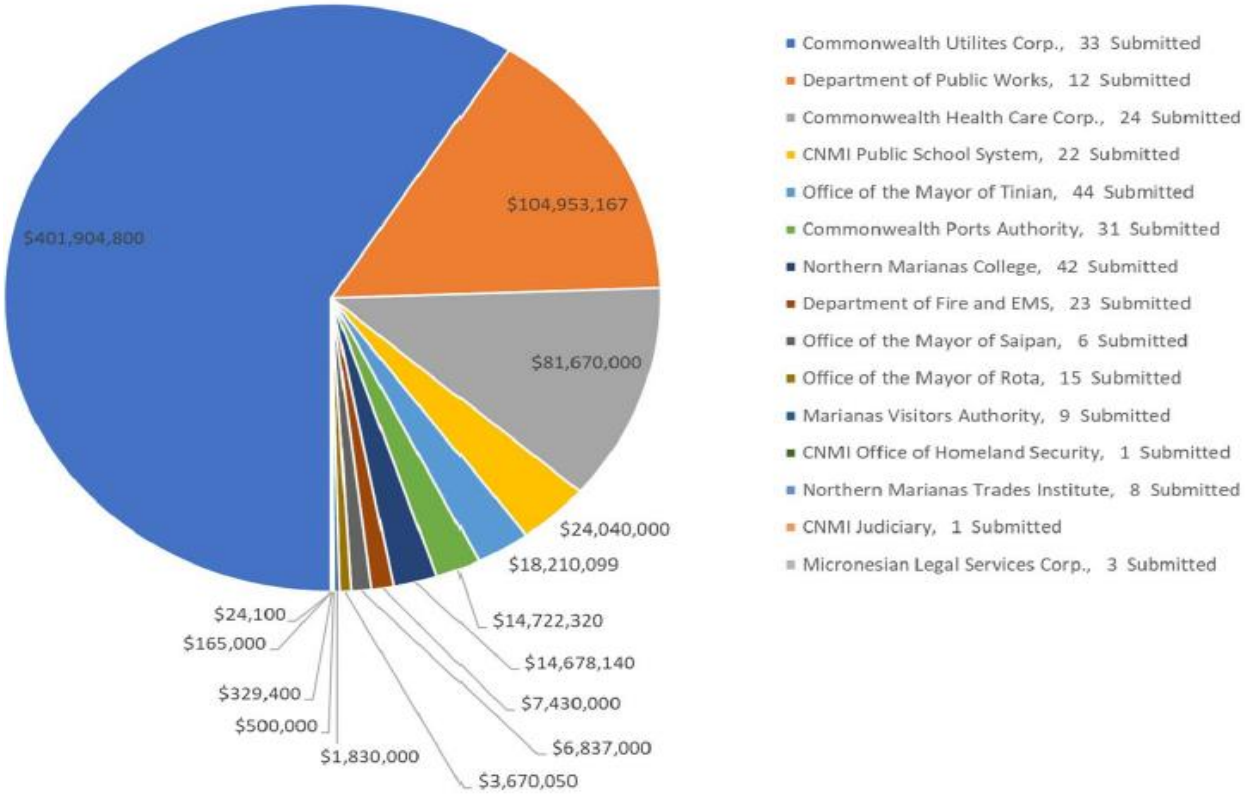


6.2 Overall Need - Infrastructure

The CNMI has identified over $680 million in potential infrastructure projects. This results in a remaining unmet need of over $526 million. These programs and projects are intended to benefit the Islands as a whole while helping to address the remaining unmet need. Figure 73 below represents the needs that were submitted by Government and Non-Profit entities. There are over 275 projects submitted that need assistance. The estimated total value of these projects as mentioned above is over $680 million. There are no funds available or other identified resources to address the remaining unmet need for infrastructure.

Infrastructure activities considered during the planning process are based on a scoring criterion with concentrations on the islands of Saipan and Tinian as most impacted areas. It was also desired that infrastructure activities selected would benefit the Islands as a whole due to the fact that any block group and/or any combination of block groups qualifies as a low- and moderate-income benefit area and that over 90 percent of the population on any island are minority residents. These factors also ensure economic stability so residents can remain in homes and residences and retain their jobs because of improved infrastructure. The actual size of the Islands and reach of community lifeline systems (e.g. power distribution) also means that all persons will benefit from most of the infrastructure improvements.

73: Potential Infrastructure Projects Needed. Projects submitted by Government and Non-Profit Entities



Source: NMHC CDBG-DR Action Plan, as amended (2021), pp. 44-45, accessed at: https://www.cnmi-cdbgdr.com/action-plan/action-plan-documents/

The following scoring criteria will be utilized during the refinement of priority infrastructure projects and activities:

74: Scoring Criteria for Infrastructure Projects and Activities

Mitigation Project Scoring Criteria			Max Points
1	**Priority Need: Meets one of the CDBG-MIT Priority Needs**		25
	Priority 1	Support the restoration or improvement of utilities, water, and sewer facilities (25 pts)	
	Priority 2	Support the restoration or improvement of roads and drainage systems (20 pts)	
	Priority 3	Support the restoration or improvement of critical facilities such as schools, hospitals, and others that provide needed services to the public (15 pts)	

	Priority 4	Support the leverage of funding with other disaster assistance (e.g. FEMA, USACE) to ensure resilient infrastructure (10 pts)	
	Priority 5	Support the restoration of other, non-critical public facilities such as community centers, gymnasiums, etc… (5 pts)	
2	**Storm Resilience:** Program and project proposals demonstrate how resilience in the face of future storm impacts will be achieved or addressed.		15
3	**Overall LMI Benefit (percent of population benefiting from action that is LMI):** Higher LMI benefit of the activity will receive a higher score (e.g. a project that benefits a population that is 100% LMI would receive 25 points)		25
4	**Management Capacity:** Sub-recipient, program manager, and/or developer has a program or project, case, and compliance management capacity to deliver services on-time and within budget.		15
5	**Cost-Reasonable Budget:** Budgets reflect cost reasonableness and efforts to leverage CDBG-MIT funds with additional funding to address unmet needs. The budget narrative reflects research, quotes, and/or contractual expenses.		20
		Total Maximum Points	100

6.3 Operations and Maintenance

NMHC CDBG will require all project applicants to include a narrative plan detailing all necessary resources for the operation and maintenance costs of projects assisted with CDBG-MIT funds. Any application for a project that has not completed engineering or architectural design shall include a narrative that addresses in a preliminary fashion, any anticipated local funding sources, local staffing, contractors, equipment, leasing costs, or cost of materials for the long-term operation and maintenance needs.

Any applications for projects that have completed design must include a complete operation and maintenance plan prior to award of funding. Conditions will be placed in Subrecipient agreements to provide quarterly operational and maintenance plan cost reports to CDBG for the life of the CDBG-MIT Program.

Subrecipients must specify in their operations and maintenance plan if any government resources including local funds will be required to support long-term operations and maintenance costs. If operations and maintenance plans are reliant on any proposed changes to existing taxation policies or tax collection practices, subrecipients must expressly include this in their plan and identify all relevant milestones.

7.0 CITIZEN PARTICIPATION PLAN

7.1 Overview

The NMHC is committed to providing opportunities for its citizens to participate in an advisory role in the planning, implementation, and assessment of its CDBG-MIT Program. The NMHC recognizes that those persons or groups affected by, or involve with projects under this program can provide meaningful assistance to those responsible for program implementation. In order to encourage and support the participation of citizens, NMHC will provide adequate information and give citizens the opportunity to comment. The exchange of information among citizens, NMHC staff, and elected officials will allow for stronger, more responsive housing and community development effort in the CNMI.

The purpose of this Citizen Participation Plan (CPP) is to allow residents the opportunity to inform the CDBG-MIT Action Plan and projects that will be funded with this grant. The design of this CPP aligns with the requirements listed in the applicable Federal Register Notices allocating funds for hazard mitigation.

Subsection V.A.3. of 86 FR 45838 reads: “To permit a more robust process and ensure mitigation activities are developed through methods that allow all stakeholders to participate and because citizens recovering from disasters are best suited to ensure that grantees will be advised of any missed opportunities and additional risks that need to be addressed….These revised requirements mandate public hearings…across HUD-identified MID areas and require the grantee to provide a reasonable opportunity (at least 45 days) for citizen comment and ongoing citizen access to information about the use of grant funds.”

The goal of this citizen participation plan is to increase public involvement with respect to the recovery efforts associated with the CDBG-MIT program, which highlight the following aspects:

a. The total amount of assistance to be provided
b. Eligible activities
c. Quarterly performance reports
d. Other Action Plan and program activities.

7.2 Goals

The goals of the CPP are to:

1. Provide for and encourage citizen participation, particularly of low- and moderate-income persons.
2. Ensure residents have reasonable and timely access to public meetings being held to receive input on the Action Plan, as well as clearly communicate to residents how to submit public comments on the Action Plan.
3. Ensure residents are notified of amendments to the Action Plan.
4. Provide residents with information about programs to be funded, how to meet national objectives and local needs, in addition to how decisions were made.

7.3 CNMI Citizen Participation Process

To facilitate public engagement, the NMHC will make the Action Plan and CPP available online at the CNMI CDBG-MIT program's website (https://www.cnmi-cdbgdr.com/CDBG-MIT/). The website will include the following:

- Summarizes the CDBG-MIT program
  - Includes the Action Plan, Action Plan Amendments, and DR Action Plan
- List of all programs and projects funded by the CDBG-MIT program
- Lists all procurement policies and activities
  - Includes notice of active procurements
  - Includes a list and summary of all contracts procured with CDBG-MIT funds
- Citizen Participation Plan
- List of CDBG-MIT policies and procedures, including:
  - Anti-Fraud, Waste, and Abuse Policy
  - Complaint and Appeals policy
- Public Meeting Notes
- Program Guidelines, including applications, required forms, and contact information

Updates to the website will be made regularly in alignment with any activity associated with the CDBG-MIT program and Action Plan. Any document created in support of the CDBG-MIT program will be added to the public website within 5 days of the final approval date.

7.3.1 Publication and Public Meetings

A public notice was published in the local CNMI newspapers for general circulation on January 26, 2022, notifying the general public about the February 9, 2022 Pre-Release Public Meeting. Subsequently, on February 2, 2022, another public notice was released providing information on the February 11, 2022 release of the Initial Draft Action Plan and the required 45-day public comment period: February 11 – April 2, 2022 and the scheduled February 16, 2022 Post-Release Public Meeting. Additionally, the plan was posted on NMHC's official website at the following address (https://www.nmhcgov.net/default.asp?secID=3). All future information will be included on the main CNMI CDBG-MIT website at (https://www.cnmi-cdbgdr.com/CDBG-MIT/).

The NMHC will make reasonable accommodations for persons with disabilities and non-English speaking residents upon request and in accordance with the Citizen Participation Plan. The aforementioned information was included in the Public Notice for a 45-day comment period. The 45-day public notice commenced on February 11, 2022 and ended on April 2, 2022. There were no public comments received on April 2, 2022.

Based on its allocation amount under this CDBG-MIT grant and per 86 FR 45838, NMHC held two (2) virtual public hearings on February 9, 2022 (Pre-Release Public Meeting) and February 16, 2022 (Post-Release Public Meeting), respectively.

This protocol for public meetings during a 45-day Public Comment period will be followed for any additional, substantial amendments to the Action Plan.

7.3.2 Submitting Comments

Comments will be collected and responded to by the NMHC. Outside of the public meetings, comments will be accepted through:

- By email: cnmi-cdbg-dr@nmhcgov.net
- In person, during office hours at any of the NMHC offices located on Saipan, Tinian, and Rota
- By U.S. mail to: P.O. Box 500514 Saipan, MP 96950

CNMI will consider all comments regardless of the method of submission. A summary of the comments is provided as an attachment to this document and provides the CNMI response to each citizen and/or entities that commented or reviewed the Draft Action Plan.

7.4 Language Access

The Northern Marianas Housing Corporation will take reasonable steps to ensure very low-, low-, and moderate- income persons, including persons with disabilities, the elderly, and persons with Limited English Proficiency (LEP) have meaningful access and an equal opportunity to participate in our CDBG-MIT services, activities, programs and other benefits. The policy of NMHC is to ensure meaningful communication with interested clients. The policy also provides for communication of information contained in vital documents related but not limited to NMHC's CDBG- MIT program, i.e., action plans, amendments to the action plan, citizen participation plans, etc. All interpreters, translators and other aids needed to comply with this policy shall be provided without cost to the person being served, and clients and their families will be informed of the availability of such assistance free of charge. Language assistance will be provided through use of competent bilingual staff, staff interpreters, contracts or formal arrangements with local organizations providing interpretation or translation services, or technology and telephonic interpretation services.

The CNMI CDBG-MIT website will be compliant with assistive screen reader technology to ensure accessibility for disabled clients going forward. All staff will be provided notice of this policy and procedure, and staff that may have direct contact with LEP individuals will be trained in effective communication techniques, including the effective use of an interpreter. The public will be informed through media outlets, paid advertisements, our CDBG-MIT website, LEP notices, posters, and literature, as well as through outreach activities.

7.4.1 Identifying LEP Persons and Their Language

NMHC will promptly identify the language and communication needs of the LEP person. If necessary, staff will use a language identification card (or “I speak cards,” available online at www.lep.gov) or posters to determine the language.

7.4.2 Obtaining a Qualified Interpreter

NMHC CDBG-MIT Admin Staff will be responsible for:

a. Maintaining an accurate and current list showing the name, language, phone number and hours of availability of bilingual staff;
b. Contacting the appropriate bilingual staff member to interpret, in the event that an interpreter is needed, if an employee who speaks the needed language is available and is qualified to interpret;
c. Obtaining an outside interpreter if a bilingual staff or staff interpreter is not available or does not speak the needed language. Some LEP persons may prefer or request to use a family member or friend as an interpreter. However, family members or friends of the LEP person will not be used as interpreters

unless specifically requested by that individual and after the LEP person has understood that an offer of an interpreter at no charge to the person has been made by the facility. Such an offer and the response will be documented in the person's file. If the LEP person chooses to use a family member or friend as an interpreter, issues of competency of interpretation, confidentiality, privacy, and conflict of interest will be considered. If the family member or friend is not competent or appropriate for any of these reasons, competent interpreter services will be provided to the LEP person. Children and other clients/residents will not be used to interpret, in order to ensure confidentiality of information and accurate communication.

7.4.3 Providing Notice to LEP Persons

NMHC will inform LEP persons of the availability of language assistance, free of charge, by providing written notice in languages LEP persons will understand and made available in a format that is accessible for persons with disabilities as provided for in the Effective Communication requirements under Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990. At a minimum, notices and signs will be posted and provided in intake areas and other points of entry at all three designated NMHC CDBG-MIT program buildings (including the Tinian and Rota Field Offices) as well as on bulletin boards of government agencies and business establishments. Notification will also be provided through one or more of the following: outreach documents, telephone voice mail menus, local newspapers, radio and television stations, and/or community-based organizations.

7.4.4 Monitoring Language Needs and Implementation

On an ongoing basis, NMHC will assess changes in demographics, types of services or other needs that may require reevaluation of this policy and its procedures. In addition, NMHC will regularly assess the efficacy of these procedures, including but not limited to mechanisms for securing interpreter services, equipment used for the delivery of language assistance, complaints filed by LEP persons, feedback from clients and community organizations, etc. NMHC will conduct a regular review of the language access needs of the LEP population, as well as update and monitor the implementation of this policy and these procedures, as necessary. To further provide meaningful client access to the CDBG-MIT Program and its services, program staff will conduct home visits, upon request, to accommodate the elderly and persons with disabilities, who are unable to physically visit NMHC due to their disability or lack of reliable transportation.

7.5 Individuals with Disabilities

The NHMC is committed to the full inclusion of all members of the public in both community engagement as well as the implementation of CDBG-MIT projects and programs, without regard to disability or any other classification protected by state or federal law. NMHC will ensure that persons with disabilities are provided reasonable accommodations as it pertains to accessing the information and participation in CDBG-MIT activities. Any member of the public can contact NMHC by phone at (670) 234-6866|9447|7670 (Saipan); (670) 433-9213 (Tinian); or (670) 532-9410 (Rota), or by email at cnmi-cdbg-dr@nmhcgov.net for support to access information and services.

8.0 PRE-AWARD IMPLEMENTATION PLAN

Pursuant to Public Law 116-20, CDBG-MIT grantees are required to submit Risk Analysis documentation to demonstrate in advance of the signing of a grant agreement that it has in place proficient controls, procedures, and management capacity. This includes the grantee's ability to prevent duplication of benefits as defined by Section 312 of the Stafford Act as well as demonstration that the grantee can effectively manage the funds, ensure timely expenditure of funds, maintain a comprehensive website regarding all disaster recovery activities assisted with these funds, and timely communication of application status to applicants for disaster recovery assistance. The grantee must also demonstrate that it has adequate policies and procedures to detect and prevent fraud, waste, and abuse.

In addition to the financial management review, each grantee is required to submit a Pre-Award Implementation Plan that describes the grantee's capacity to carry out recovery efforts and activities, including operational and program management functions relative to CDBG-MIT funding. Any capacity gaps must be identified and filled based on the plan and timeline outlined by the grantee. The CNMI submits its Pre-Award Implementation Plan with this Initial Action Plan.

8.1 Capacity Assessment

8.1.1 CDBG Experience

The CNMI, through the Northern Marianas Housing Corporation (NMHC), has being receiving annual allocations of CDBG funding from the U.S. Department of Housing and Urban Development (HUD). Typically, the CNMI utilizes its CDBG program funds to support public facilities, including public health and safety, infrastructure, and public services.

Most recently, with the allocation of nearly $244 million in CDBG-DR funds and an additional $10.3 million in supplemental appropriations needed to address the CNMI's unmet needs, NMHC's capacity-building was necessary. Aptly, a CDBG-DR Division within NMHC was created and consisting of the following sections: 1. Internal Audit; 2. Housing Programs; 3. Projects; 4. Compliance; 5. Administrative; 6. Finance; and 7. Procurement.

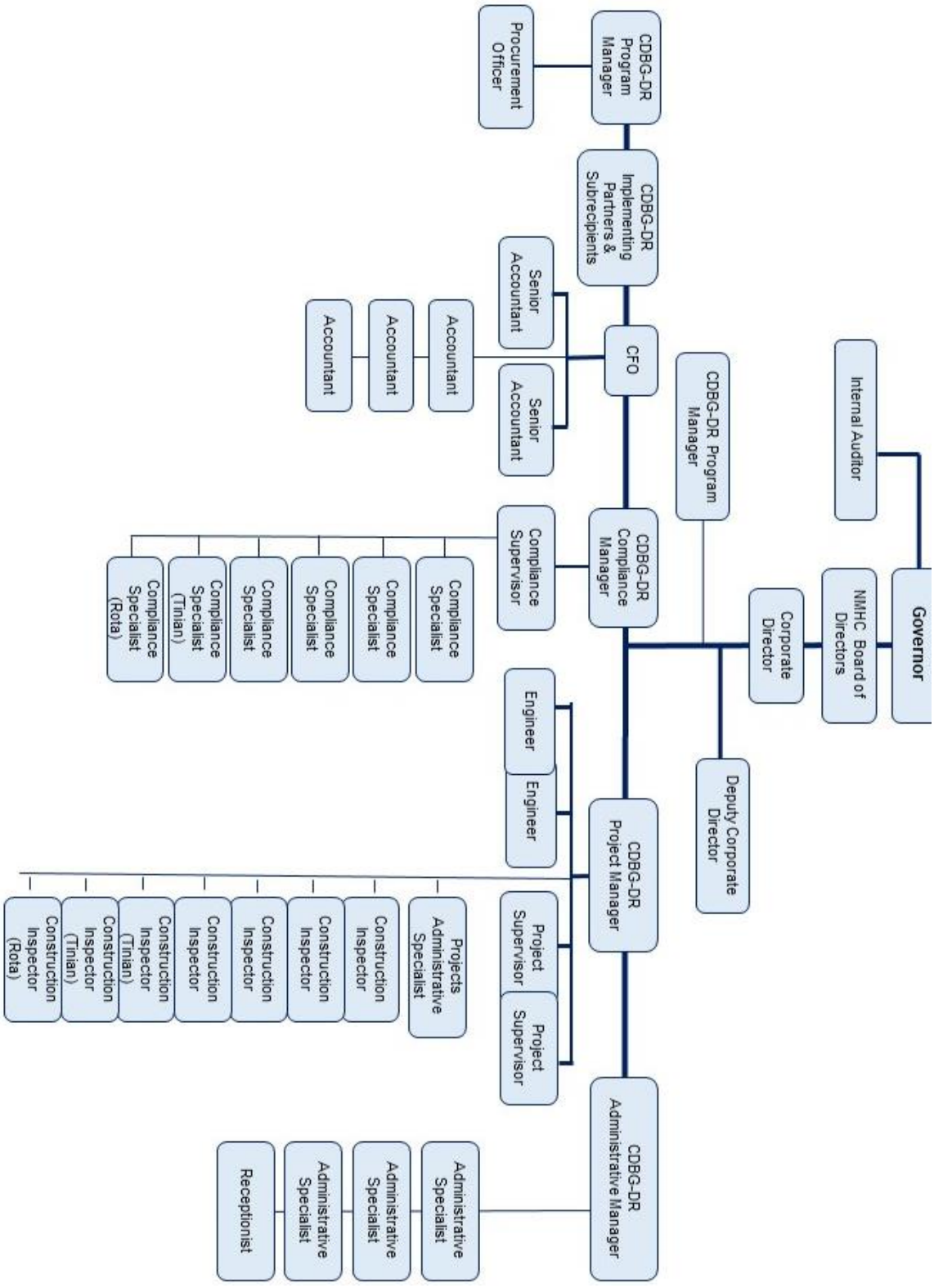
8.1.2 Key Partner Agencies

Similar to its CDBG-DR Infrastructure Program, NMHC's key partner agencies include: 1. FEMA; 2. CNMI Public Assistance Office (PAO); 3. CNMI Office of Planning and Development (OPD); 4. CNMI Department of Public Works (DPW); 5. CNMI Infrastructure Recovery Program (IRP); 6. CNMI Office of Homeland Security and Emergency Management Services; 7. Historic Preservation Office, 8. CNMI Yutu Governor's Authorized Representative (GAR); and 9. CNMI Office of the Governor.

8.1.3 Staffing and Collaboration

Due to limited funds, NMHC will utilize its key CDBG-DR personnel (projects, procurement, finance, program and planning, and compliance) to implement CNMI-MIT funded programs to ensure administrative, financial and programmatic compliance and effectiveness for all its CDBG-MIT activities. The NMHC CDBG-DR Division shall collaborate with CNMI key partner

agencies in carrying out mitigation projects. The following schematic outlines the organization of CDBG-DR personnel in CNMI.



8.1.4 Current Capacity to Carry Out Mitigation Objectives

Given the successful management of previous CDBG and current CDBG-DR programs and projects, NMHC's CDBG-DR team is confident that the organizational and staffing structure will provide most of the necessary support for successful implementation and compliant oversight of the CDBG-MIT grant. As per the NMHC CDBG-MIT organizational chart (see previous page), there are currently six (6) full-time positions across management and the five units (Procurement, Finance and Accounting, Compliance, and Projects). Staff roles include Senior Management (Corporate Director, Deputy Corporate Director, and Chief Financial Officer), the CDBG-DR Program Manager, CDBG-DR Administrative Manager, CDBG-DR Project and Compliance Managers, Senior Accountants, CDBG-DR Project Inspectors, and Compliance Specialists. Additional support services would be provided to complete Environmental Reviews, Financial Management, and CDBG-MIT Program Operations. NMHC plans to outsource professional and technical services as needed.

8.1.5 Identified Capacity Gaps

To ensure that NMHC continues to manage the programs as a responsible steward, several positions in various disciplines will be added to NMHC CDBG-MIT Division to support the management of the CDBG-MIT grant. The CDBG team utilized HUD's staffing worksheet and identified the following gaps with Staff Capacity to fully manage its CDBG, CDBG-DR, and CDBG-MIT subrecipients and activities.

NMHC is inclined to spend a large portion of the money within the first six years. Possible risks to that inclination include: 1. CDBG-MIT Division will be dependent on the number of "quality" projects submitted after the release of each RFP, 2. The efficacy of each project to be successful, subrecipients' capacity and ability to stay on schedule, and 3. The number and type of NMHC CDBG-DR staff dedicated to CDBG-MIT at any point in time. A higher number of good projects submitted within the first year will be pivotal in getting NMHC's CDBG-MIT funding disbursed to the subrecipients and spending on schedule.

It is currently anticipated that CDBG-DR Program Manager, CDBG-DR Compliance Manager, and CDBG-DR Projects Manager will be brought into the team to address program management gaps. More detail on how existing CDBG-DR staff will transition to support CDBG-MIT activities is written in the next section. As the program passes certain milestones, NMHC will reevaluate staffing needs annually to determine when to transition certain positions, if additional hires are necessary, or whether to augment staff with a consultant or contract positions.

75: Table of Identified Capacity Gaps for CDBG-MIT Activities

Area of Need	Current Staff Support	Identified Gap (FTEs)	Capacity Description
Grants Management	Corporate Director Deputy Corporate Director Chief Financial Officer CDBG-DR Program Manager CDBG-DR Projects Manager CDBG-DR Compliance Manager	No Gap identified	Manage program progress, risks, communication, complaints Manage strategic partnerships (government agencies) Recommend projects for approval

Financial Management and Planning	Chief Financial Officer Senior Accountants	The CDBG-MIT Finance section will be managed by NMHC's Chief Financial Officer (CFO), who was previously the CDBG-DR Finance Manager. Since NMHC's CFO possesses vast knowledge on CDBG-DR and manages DRGR, NMHC decided that the CFO will continue to oversee CDBG-DR and CDBG-MIT Finance, with the assistance of the CDBG-DR Senior Accountant, until local capacity is built within the CDBG-DR Finance Section and the CDBG-DR Finance Manager position is filled. NMHC will announce the CDBG-DR Finance Manager position after the CDBG-MIT grant agreement is approved. The CDBG-DR Finance Manager will be assigned to oversee CDBG-MIT Finance. In the interim, the CFO will manage both CDBG-DR and CDBG-MIT Finance sections.	Review and process payments/invoices Manage DRGR and QPR reporting Track Project and program budgets Financial reporting
Procurement and Contract Management	NMHC Office Manager/Procurement Officer CDBG-DR Administrative Manager CDBG-DR Procurement Officer	No Gap identified	Maintain procurement and contract registry
Data Systems and Reporting	NMHC Office Manager/Procurement Officer CDBG-DR Administrative Manager CDBG-DR Procurement Officer	No Gap identified	Outsource services for GIS mapping analysis and data research
Training	CDBG-DR Administrative Manager CDBG-DR Program Manager	No Gap identified	Develop policy and procedures manual Identify ongoing training needs, develop training plan for MIT staff, and

			implement/outsource training services
Compliance and Monitoring	Internal Auditor CDBG-DR Compliance Manager	The Internal Auditor position is currently vacant and has been re-announced through JVA No. 2022-022. The JVA spans from January 17, 2022 – February 16, 2022. NMHC hopes to have this position filled and shall continue to announce the position until it is filled.	Conduct internal and external monitoring NMHC will assign a CDBG-DR Compliance Supervisor who will allocate time across CDBG-MIT and CDBG-DR. If needed at a later time, another staff member with supervisory role will be assigned.
Human Resources	NMHC Office Manager/Procurement Officer CDBG-DR Administrative Manager	No Gap identified	Separate Department to support this need
Communications and Outreach	CDBG-DR Program Manager CDBG-DR Administrative Manager CDBG-DR Administrative Manager	No Gap identified	Manage website Assist in management of DRGR QPR reporting
Program Operations: Infrastructure	CDBG-DR Project Manager CDBG-DR Compliance Manager	No Gap identified	Oversee operations of CDBG-MIT Infrastructure Mitigation Program Manage projects for approval to closeout

8.1.6 Key Staffing Roles and Descriptions

To preserve the use of limited CDBG-MIT administrative funding for the full 12-year span, NMHC will hire additional staff only when a clear need is identified. NMHC has made the following assessment of staff's capacity to fulfill the following roles as they relate to the management and oversight of the CDBG-MIT program.

Key Staff Staffing Roles and Descriptions

(a) *Case Management*. NMHC will provide direct program implementation services for the CDBG-MIT program. The Project Manager, Project Supervisors, and their respective project staff will be responsible for systematic case management services for all program applicants.

(b) *Project Management*. For the CDBG-MIT Program, NMHC will utilize the CDBG-DR Project Manager to provide oversight and technical assistance for the allocated funds. The CDBG-DR Project Manager will provide ongoing technical assistance to Implementing Partners (subrecipients), monitor project activities for compliance, and tracking performance measures. Similar to the CDBG-DR program, NMHC will also offer additional technical assistance and project management skills that can assist Implementing Partners develop complete their project applications under the CDBG-MIT Program.

(c) *Procurement and Contract Management*. Similar to its CDBG-DR Program, NMHC will utilize its own procurement and contracting processes.

(d) *Section 3 and FHEO Compliance*. The CDBG-DR Project Manager, CDBG-DR Compliance Manager, and/or the CDBG-DR Procurement Officer can provide guidance to eligible applications regarding Section 3 requirements and how to comply with Fair Housing. NMHC has established a Section 3 plan for CDBG and CDBG-DR and can utilize that plan to advise on procedures related to CDBG-MIT. NMHC has delegated the CDBG-DR Project Manager to serve as the FHEO person assigned to CDBG-MIT programs.

(e) *Environmental Compliance*. The CDBG-DR Infrastructure and Compliance Units can assist with ensuring program compliance with Environmental Reviews and Clearance.

(f) *Financial Management*. To guarantee the proper disbursement of funds, NMHC will rely on the support of its CDBG-DR Finance Unit. Other key staff (Deputy Corporate Director and Compliance Manager) bring experience with HUD's grant management systems of IDIS and DRGR that enables NMHC to effectively manage and report on the progress of CDBG-MIT funds.

(g) *Monitoring and Quality Assurance*. NMHC's dedicated CDBG-DR Compliance Unit, led by the CDBG-DR Compliance Manager, will perform routine reviews of program participants, subrecipients, and/or contractors, as applicable, to ensure the projects funded are implemented by NMHC are in complete compliance with all CDBG-MIT program requirements. The CDBG-DR Compliance Unit already has experience in monitoring CDBG-DR programs that provide experience with the necessary policies, systems, and procedures that consider HUD program rules and regulations, civil rights, environmental and labor standards, Fair Housing, Section 3, citizen participation, reporting, and recordkeeping requirements. Key staff (Compliance Manager and Compliance Supervisor) will assist in the oversight of the CDBG-MIT program.

(h) *Independent Audit Staff*. NMHC has vacant position for an external auditor for CDBG-DR who reports directly to the CNMI governor and is separate from the functions of CDBG-DR and CDBG-MIT. The Internal Auditor's role is to ensure effective grant management and ensure accuracy of information, while helping to avoid findings and concerns from the Office of the Inspector General (OIG) and findings and concerns from the HUD monitoring visits. By monitoring, analyzing, and assessing the risks and controls of the organization, the Internal Auditor can provide ongoing assurance that the grantee is maintaining internal controls in order to comply with laws, regulations, and provisions of contract agreements.

NMHC Positions and Job Descriptions

(a) *Corporate Director*. The Corporate Director oversees the administration and management of disaster recovery programs under the Community Development Block Grant – Disaster Recovery (CDBG-DR) and Community Development Block Grant Mitigation (CDBG-MIT) Divisions.

(b) *Deputy Corporate Director*. The Deputy Corporate Director, who leads the Planning Division and assists the Corporate Director oversee the CDBG-DR and CDBG-MIT programs of both Divisions. She is currently NMHC-DR point of contact, liaising with the Office of the Governor, and all interagency partners in the executive branch and various autonomous agencies.

(c) *CDBG-DR Program Manager*. Oversees and directs the work of professional technical staff related to operations, implementation, and program development related to all three (3) CDBG-DR programs (housing, infrastructure, and economic development) and the CDBG-MIT program.

(d) *CDBG-DR Finance Manager* (Vacant) – The CDBG-DR Finance section is currently being managed by NMHC's Chief Financial Officer. This critical position is directly responsible for and oversees and directs the work of professional staff related to overall financial management and fiscal compliance of disaster recovery programs for CDBG-DR and CDBG-MIT, including review, process, reconciliation and analysis of financial and compliance data, reporting, and operations within the protocols of internal controls and the elimination and prevention of fraud, waste, and abuse. This individual is credentialed and possesses a CPA with prior wealth of experience in the private business sector abroad. In the interim, this individual has been instrumental in the pre-award phase, providing input and developing the CDBG-MIT finance/fiscal policies under the leadership of the Corporate Director and Deputy Corporate Director.

(e) *CDBG-DR Project Manager*. This position is essential in providing internal institutional knowledge and technical capacity to lead in the review and implementation of the anticipated wide range of construction projects under the three (3) CDBG-DR program areas and CDBG-MIT program. This individual oversees and directs the work of staff and consultants related to projects management and operations implementation of disaster recovery and mitigation programs focused on housing, infrastructure, economic recovery, infrastructure mitigation. He will also oversee and coordinate associated work related to environmental reviews, construction projects management, and securing permitting, as necessary.

(f) *CDBG-DR Compliance Manager*. This position is considered critical to the success of the CDBG-DR and CDBG-MIT program in the area of programmatic monitoring and grant compliance. This person oversees and directs the work of staff and consultants related to operations implementation of approved disaster recovery programs and construction projects focused on housing rehabilitation and replacement, infrastructure and economic recovery, and mitigation projects. She also coordinates all work associated with grant compliance related to monitoring and quality assurance.

(g) *CDBG-DR Administrative Manager*. This position is vital to ensuring that all administrative aspects of the CDBG-DR and CDBG-MIT programs are handled and administered effectively and seamlessly, which overlaps all sections under CDBG-DR and CDBG-MIT Divisions. Among the key areas to handle are development and management of data banks for various forms and applications developed and kept as a matter of manual records and files for inspection and auditing, development of core program standard applications and forms to be electronically or digitally available and filed/managed for ease of access and audit review, responsible for the postings and periodic updates of all CDBG-DR and CDBG-MIT program matters in NMHC's dedicated CDBG-DR and CDBG-MIT website, respectively, with the CDBG-DR IT Network Administrator who will be primarily responsible of, coordinates logistics and planning for public outreach and interagency communications, liaise with the main office on matters related to HR, Payroll, contracts, coordinating with consultants, and handling DR Division inventory, supplies, and property management assets, etc. Further, this position will work closely with the Procurement Officer to handle all procurement and contracts matters.

(h) *CDBG-DR Procurement Officer*. In consultation with the Corporate Director, Deputy Corporate Director, CDBG-DR Program Manager, and NMHC's Office Manager/Procurement Officer, this individual oversees all CDBG-DR and CDBG-MIT procurement-related matters in a prudent, independent, and impartial manner.

(i) *Section Supervisors*. Under the direction of their respective Managers who oversee them, Section Supervisors are responsible for the day-to-day activities associated with implementing and performing the requisite programmatic and operational responsibilities prescribed by the myriad of policies and procedures developed by management, including application intake and review, project management and tracking, programmatic and projects compliance, financial and fiscal and compliance functions with particular focus on data management and reporting for CDBG-DR and CDBG-MIT, internal control, and quality assurances.

(j) *CDBG-DR Compliance Specialists*. Under the direction of and in coordination with their Compliance Manager the compliance specialists (monitoring/quality assurance) are responsible for activities associated with overseeing programmatic and operations, projects, and grants compliance functions with particular focus on monitoring and quality assurance for CDBG-DR and CDBG-MIT.

(k) *CDBG-DR Accountants, Administrative Specialists, and Procurement Specialists* (vacant). Under the direction of and in coordination with their respective supervisors: CDBG-DR Finance Manager, CDBG-DR Administrative Manager, and CDBG-DR Procurement Officer, the accountants (fiscal/compliance) and procurement and administrative specialists (procurement/contract management) are responsible for tasks and activities associated with overseeing fiscal and compliance functions with particular focus on US federal and state compliance and procurement for CDBG-DR and CDBG-MIT in coordination with the NMHC CDBG-DR Procurement Office and NMHC's Procurement Office under the Administration Division.

(l) *CDBG-DR Construction Inspectors* (Housing, Infrastructure, and Economic Recovery). Under the direction of and in coordination with the Program Manager and Project Manager, these frontline specialists and projects inspectors are primarily responsible for the day-to-day activities associated with all phases of administering the CDBG-DR housing, infrastructure, and economic recovery programs and CDBG-MIT program in compliance with both US federal and CNMI state requirements and as prescribed by approved policies and procedures.

8.2 Technical Assistance

HUD has provided much-needed third-party technical assistance to the CNMI for its CDBG-DR programs and the development of this CDBG-MIT program and Action Plan. HUD-provided technical assistance to the CNMI has been critical to date, outlining specific requirements of governing Federal Register Notices and guidance as the CNMI works on developing and implementing its CDBG MIT programs. The technical assistance comes in the form of training, online resources from HUD Exchange, coordinated meetings, and general policy guidance and clarification of statutory program requirements.

HUD has procured ICF, a private consulting firm, and NMHC has procured the services of Pacific Coastal Research and Plan (PCRP), another private consulting firm, who are assisting

NMHC with CDBG-DR and CDBG-MIT grants. The scope of the work will include providing technical assistance upon request to current NMHC staff members. Should NMHC determine that a knowledge gap or technical expertise is lacking, a request will be made for technical assistance from its procured contractor and/or HUD. NMHC will build upon the CDBG-DR knowledge gained from any technical assistance received to continue the development of expertise to oversee future CDBG-related funding administered by NMHC. Expertise will be sought after for the following areas:

- Project Application
- Program Policies and Procedures
- Monitoring
- Computer system implementation
- Training for subgrantees

Knowledge Gaps

NMHC recognizes the value of timely and pertinent technical assistance specific to the program requirements associated with the CDBG-MIT grant. The agency will ensure that staff have adequate knowledge for managing the CDBG-MIT program during the course of the grant through:

▪ **Ongoing Technical Assistance with HUD: NMHC** has initiated ongoing technical assistance meetings with HUD bi-weekly to ensure that the State is administering its CDBG-DR and CDBG-MIT programs that are both in compliance with federal regulations and streamlined for efficiency. There are also regular weekly meetings with ICF, a HUD-paid CDBG-DR/MIT technical assistance assigned to the CNMI. A training schedule has been developed with ICF.

As NMHC begins to implement the grant, PCRP will help reevaluate staffing capacity to address future capacity gaps if applicable and offer guidance and solutions on DRGR data management.

▪ **Staff Training:** HUD has procured ICF to offer program guidance and direct the agency on the best way to setup programs, administer the funds, and train staff through March 2022.

▪ **Conferences/Workshops:** Some key NMHC staff have attended regular trainings administered by HUD and other entities. These workshops have been important for other grants (e.g., CDBG-DR) in decreasing the time of recovery post-disaster. With CDBG-MIT, off-island training will be planned and scheduled as needed.

8.3 Accountability

The NMHC CDBG-DR Division is the administering agency for the CDBG-MIT grant award. The NMHC Corporate Director is responsible for program oversight and implementation and through the NMHC CDBG-DR Division, is tasked with program coordination among State and Local agencies/stakeholders and will serve as the lead point of contact for HUD related to monitoring, compliance, and issue resolution. The Corporate Director reports to the NMHC Board of

Directors and the CNMI Governor and regularly reports on activities directly to the NMHC Board of Directors, the CNMI Governor, and the general public.

The Northern Marianas Housing Corporation currently administers multiple grant programs funded by HUD. The CNMI has designated NMHC to administer the day-to-day operations of the CDBG-DR and CDBG-MIT programs.

- Jesse S. Palacios the NMHC Corporate Director and reports directly to the NMHC Board of Directors who, in turn, report to the Office of the Governor. Mr. Palacios briefs both the NMHC Board and the CNMI Governor on program progress and major decisions.

- Zenie P. Mafnas, NMHC's Deputy Corporate Director who reports directly to the NMHC Board of Directors who, in turn, report to the Office of the Governor. Ms. Mafnas assists the Corporate Director oversee NMHC's overall operations and serves at the agency's official liaison to the Office of the Governor and CNMI Government Offices.

- Staff Internal Auditor (Vacant position), reports directly to the CNMI Governor on matters involving CDBG-DR and CDBG-MIT grant administration and compliance.

- Jeffrey Q. Deleon Guerrero is NMHC's Chief Financial Officer. He reports directly to the NMHC Board of Directors who, in turn report to the Office of the Governor. Mr. Deleon Guerrero is charged with overseeing NMHC's overall finances that include CDBG-DR and CDBG-MIT.

- Kimo M. Rosario is NMHC's CDBG-DR Program Manager. He reports to the Corporate Director and Deputy Corporate Director and coordinates with both to align grant implementation with CDBG-DR and CDBG-MIT strategic goals and objectives.

8.4 Pre-Award Cost Reimbursement

The CNMI anticipates eligible CDBG-MIT program costs prior to the execution of a grant agreement to include expenditures for Action Plan development, environmental review, and implementation of the Citizen Participation Plan.

8.4.1 Reimbursements on NMHC CDBG-MIT Planning and Administrative Activities [Pre-Grant Agreement Incurred Costs]

(a) Planning

The eligible activity is planning, urban environmental design, and policy-planning-management-capacity building activities as listed in 24 CFR 570.205 or 570.483(b)(5) and (c)(3).

The eligible activity is planning, urban environmental design, and policy-planning-management-capacity building activities that include.

(1) Planning activities which consist of all costs of data gathering, studies, analysis, and preparation of plans and the identification of actions that will implement such plans, including, but not limited to:

(i) Comprehensive plans;

(ii) Community development plans;

(iii) Functional plans, in areas such as: Housing, including the development of a consolidated plan; Energy use and conservation; Utilities;

(iv) Other plans and studies such as:

Plans or studies to demonstrate HUD's "Most Impacted and Distressed" (MID) Areas for Saipan and Tinian and for selection of activities that are appropriate for MID areas. Small area and neighborhood plans;

Individual project plans (but excluding engineering and design costs related to a specific activity which are eligible as part of the cost of such activity under §§570.201-570.204);

The reasonable costs of general environmental, urban environmental design and historic preservation studies; and general environmental assessment- and remediation-oriented planning related to properties with known or suspected environmental contamination. However, costs necessary to comply with 24 CFR Part 58, including project-specific environmental assessments and clearances for activities eligible for assistance under this part, are eligible as part of the cost of such activities under §§ 570.201-570.204. Costs for such specific assessments and clearances may also be incurred under this paragraph but would then be considered planning costs for the purposes of § 570.200(g);

Strategies and action programs to implement plans, including the development of codes, ordinances, and regulations; Assessment of Fair Housing.

(2) *24 CFR 570.489(b): Reimbursement of pre-agreement costs*. The State may permit, in accordance with such procedures as the State may establish, a unit of general local government to incur costs for CDBG activities before the establishment of a formal grant relationship between the State and the unit of general local government and to charge these pre-agreement costs to the grant, provided that the activities are eligible and undertaken in accordance with the requirements of this part and 24 CFR part 58. A State may incur costs prior to entering into a grant agreement with HUD and charge those pre-agreement costs to the grant, provided that the activities are eligible and are undertaken in accordance with the requirements of this part, part 58 of this title, and the citizen participation requirements of part 91 of this title.

[53 FR 34439, Sept. 6, 1988, as amended at 56 FR 56127, Oct. 31, 1991; 60 FR 1915, Jan. 5, 1995; 71 FR 30035, May 24, 2006; 80 FR 42366, July 16, 2015]

(b) Administration

The eligible activity is program administration as listed in 24 CFR 570.204 as defined by the Federal Register Vol. 85, No. 17 for the 6-yr. duration of the CDBG-DR Program. The activity pays for administration costs such as compliance, monitoring, and audit related functions and supports the overall administration of the projects, programs, and activities funded with the CDBG-DR dollars.

(i) *24CFR 570.489(b): Reimbursement of pre-agreement costs.* The State may permit, in accordance with such procedures as the State may establish, a unit of general local government to incur costs for CDBG activities before the establishment of a formal grant relationship between the State and the unit of general local government and to charge these pre-agreement

costs to the grant, provided that the activities are eligible and undertaken in accordance with the requirements of this part and 24 CFR part 58. A State may incur costs prior to entering into a grant agreement with HUD and charge those pre-agreement costs to the grant, provided that the activities are eligible and are undertaken in accordance with the requirements of this part, part 58 of this title, and the citizen participation requirements of part 91 of this title.

8.5 Management of Funds

The CNMI, through NMHC, shall seek reimbursements for these eligible expenditures following the execution of a grant with HUD for CDBG-MIT grant funds. NMHC will ensure that the appropriate protocols are in place to manage the CDBG-MIT funds and to incorporate measures to prevent any fraud, waste and abuse of government funds. Furthermore, NMHC will use its existing protocols and resources, supplemented by potential consultants, to assist in the development of policies, procedures, and other program resources to effectively manage program funds.

8.6 Leveraging Financial Resources

The CNMI is committed to the strategic use of limited funds and resources for hazard mitigation efforts. Appropriately, it will leverage multiple sources of funding, where possible, to maximize mitigation actions. This includes prioritizing projects in which other Federal, State, and Local funding sources can be leveraged to allow CDBG-MIT funding to pay only a portion of project costs.

To the greatest extent possible, NMHC will leverage funds that will result in efficient utilization of all funds and to maximize recovery dollars whenever possible to create an efficient and comprehensive approach. NMHC may also add leveraging requirements to specific program policies and guidelines as needed. The CNMI government resources are limited; therefore, there are no dollars expected to be available to complete the disaster projects.

8.7 Action Plan Amendments

8.7.1 Substantial Amendments are required when there is a change in program benefit/eligibility criteria, addition/deletion of an activity, or re-allocation of substantial amounts. A substantial amendment will also be required if any program changes exceed five million dollars ($5,000,000.00). Substantial amendments must provide a reasonable opportunity (at least 45 days) for citizen comment. All changes will be documented by NMHC's CDBG-MIT Program to provide both necessary and reasonable justifications. All substantial amendments will include the following:

(a) The exact identification of which content is being added, deleted or changed

(b) A clear description of where funds are moved from/to

(c) The updated and revised budget after re-allocation of funding NMHC will notify HUD of any non-substantial amendments within five business days before it becomes effective. These changes will be listed and available for the public via the CNMI CDBG-MIT website at https://www.cnmi-cdbgdr.com/CDBG-MIT/.

8.7.2 Substantial and Non-Substantial Amendments

(a) A *substantial amendment* is defined as a change in program benefit or eligibility criteria; the addition or deletion of an activity; or the allocation or reallocation of a monetary threshold specified by the grantee in its action plan. The CNMI monetary threshold for a substantial amendment is any changes in Action Plan amounts that exceed $5 million. Substantial amendments are changes to an Action Plan which require a 45-day public comment period. All amendments will be listed on the CDBG-MIT website sequentially.

(ii) Non-substantial amendments require notice to HUD at least 5 days prior to the amendment going into effect. They do not require notice to the Public on changes of $5 million or less. All amendments will be listed on the CDBG-MIT website sequentially.

8.8 Performance Period

Section V. of Federal Register 86 FR 568, published on January 6, 2021, requires CDBG-MIT grantees to expend 50 percent of its CDBG-MIT grant for 2018 qualifying disasters on eligible activities within six (6) years of HUD's execution of the grant agreement and 100 percent of its CDBG-MIT grant for 2018 qualifying disasters within twelve (12) years of HUD's execution of the grant agreement. The CNMI has developed procedures to ensure the timely expenditures of funds.

8.9 DRGR Reporting

The HUD Disaster Recover Grant Reporting (DRGR) system is HUD's official system of record to submit the Detailed Action Plan for project setup, fund drawdowns, reporting program income, if any, and submission of Quarterly Performance Reports.

NMHC will use HUD's DRGR system to draw down funds and submit quarterly performance reports. NMHC has established clear lines of responsibility, approval authority, including separation of duties, and developed financial management and internal control transactions as prescribed by HUD and required for the use of HUD's DRGR portal.

8.10 Financial Controls

As a recipient of federal funds, the CNMI is subject to the Single Audit Act of 1984, as amended in 1996. The Single Audit Act, which standardizes requirements for auditing federal programs, requires reviews of all federal programs by an independent Certified Public Accountant (CPA) for compliance with program requirements and proper expenditure of funds. The Northern Marianas Housing Corporation coordinates the conduct of the single audit with an independent CPA annually. The single audit report completed for each fiscal year is submitted to the NMHC Board of Directors, the CNMI Office of the Public Auditor, and the CNMI governor and is also made available on NMHC's website.

The CNMI has completed and submitted the P.L.s 116-20 and 115-254 Financial Management and Grant Compliance Certification to HUD on August 2, 2021, which HUD subsequently approved on September 10, 2021. This was prepared and completed by NMHC's Chief Financial Officer and Finance Department. The CNMI, through NMHC, has affirmed that it has the requisite financial controls in place to account for the $16,225,000 of CDBG-MIT funds in a manner that is consistent with all federal and local accounting requirements.

NMHC's CDBG-DR program, while recognizably different from the CDBG-MIT program, is structurally similar with many of the same regulatory requirements. This provides NMHC with a considerable amount of familiarity with much of the regulatory requirements and processes of the CDBG-MIT program. The CNMI and NMHC are fully aware of the differences between the disaster recovery and hazard mitigation programs and will make the necessary accommodations to comply.

NMHC will employ the use of three Enterprise Management Software Systems to manage the CDBG-DR grant. The three (3) systems are listed as follows:

- *Winten2 Property Management Software*: provides a means of tracking all CDBG-DR and CDBG-MIT expenditures and revenues, as well as reporting capabilities;
- *HUD's Disaster Recovery Grant Reporting System (DRGR)*: allows for submission of financial and performance data for any activities funded by CDBG-DR and CDBG-MIT grants;
- *Servicer 3D*: provides loan servicing management, collection management, escrow management, and built-in reporting.

All documents related to CDBG-DR and CDBG-MIT funds are vetted for reasonableness and necessity. All data will be maintained within the three financial systems listed above.

NMHC understands that the DRGR system is HUD's official system of record to submit the detailed Action Plan for project set-up, draw down funds, report program income, and submit Quarterly Performance Reports (QPR). The official system of record for NMHC financial records and reporting is HUD's Disaster Recovery Grant Reporting System. NMHC staff will be responsible for all DRGR project set-up, data entry, quarterly reporting, and Action Plan amendments. Funding drawdowns, approvals, and other financial activity will be managed by NMHC's Finance and Accounting staff only.

8.11 Preventing Duplication of Benefits

Section 314 of the Stafford Act prohibits any person, business concern or other entity from receiving federal funds for any part of such loss as to which he/she has already received financial assistance under any other program, private insurance, charitable assistance, or any other such. Such duplicative funding is called "Duplication of Benefits" (DOB). This policy/regulation applies to NMHC's CDBG-DR and CDBG-MIT programs.

42 U.S.C. 5155 (a) provides that, "a duplication of benefits occurs when a beneficiary receives assistance from multiple sources for a cumulative amount that exceeds the total need for a recovery purpose. The amount of the duplication is the amount of assistance provided more than need."

In strict conformance with the Stafford Act, the CNMI will establish and follow policies and procedures to uphold the safeguard against DOB within its program guidelines for each eligible activity.

8.12 Procurement

CDBG-MIT funds shall be subject to NMHC procurement regulations, as authorized by CNMI Law (P.L. 20-87 codified at 2 CMC § 4433) and federal general procurement standards at 2 CFR Part 200.318.

In addition to compliance with NMHC's procurement regulations at NMIAC § 100-60, all NMHC procurement activities for with CDBG-MIT funds are to be performed in accordance with appropriate federal and state statutes, rules, and regulations, whichever is stricter. Copies of federal and local statutes, rules, and regulations covering the use of federal funds shall be maintained by the CDBG-DR procurement office.

The CNMI, through NMHC, is currently following its established procurement regulations and has developed procedures related to procurement for the expenditures of CDBG-DR and CDBG-MIT funds to ensure these standards are equally or more restrictive as the federal requirements. However, where the local procurement standards are less restrictive, the more stringent federal requirements will be followed for CDBG-DR and CDBG-MIT programs.

8.13 Documentation and Monitoring

The CNMI recognizes that it has a fiduciary duty to ensure proper disbursement of grant funds for eligible activities. The CNMI will remain in compliance with applicable CDBG-MIT rules and regulations as well as other applicable federal regulations, which include but are not limited to: OMB Circulars A-87, A-133, 2 CFR 200.318 – 326 and 24 CFR Part 85 (Uniform Administrative Requirements) in the management of CDBG-MIT funds. The CNMI, through NMHC, shall institute measures to detect, investigate, and mitigate fraud, abuse, and mismanagement related to accounting, procurement, and accountability. The CNMI will adhere to the conflict-of-interest provisions provided at 24 CFR 570.

HUD will conduct monitoring for compliance by the CNMI against federal requirements and programmatic policies and procedures throughout the life of the CDBG-MIT grant award. NMHC, through its internal monitoring procedures, will also be responsible for maintaining compliance to federal requirements and programmatic policies associated with the CDBG-MIT grant award. These prescribed activities will ensure that the CNMI will:

(a) Fund only expenditures that are eligible CDBG activities, address hazard mitigation-related needs, and meet at least one (1) of the CDBG national objectives.

(b) Document that all program activities meet a national objective, address hazard mitigation-related needs, and are eligible activities.

(c) Document all program costs and maintain supporting documentation for all administrative costs incurred and activities undertaken.

(d) Develop a monitoring policy that will outline the activities that will be monitored and the compliance parameters for each activity, including frequency of the monitoring activities.

(e) Provide a quality assurance (QA) and quality control (QC) functions for internal checks and balances, including random sample file audits as a self-check. This will include source documentation file audits conducted monthly by CDBG-DR staff as a first-level internal check.

(f) Utilize the HUD-provided DRGR contracts management system and upload all quarterly performance reports (QPR) to that system. NMHC will develop QPRs that will be submitted to HUD no later than 30 days following the end of each quarter after grant award and continuing until all funds have been expended and all expenditures have been reported.

(g) Enter Action Plan for Hazard Mitigation, including performance measures, into HUD's DRGR system. As more detailed information about uses of funds is identified, NMHC will enter such detail into DRGR.

(h) Develop and implement corrective actions if any weaknesses are identified during the monitoring activities.

Internal Auditor

NMHC employs an Internal Auditor. The Internal Auditor is responsible for assessing risk and reviewing internal controls of CDBG-DR and CDBG-MIT programs. Under the direct supervision of the CNMI Governor, the Internal Auditor plans, coordinates, and supervises the conduct of audits and technical studies in the review, analysis, development, installation and establishment of accounting and internal control systems and procedures for NMHC's CDBG-DR and CDBG-MIT fiscal operations.

8.14 Conflict of Interest

The CNMI will adhere to the conflict-of-interest provisions referenced at 24 CFR 570.611, CNMI Ethics Law, and NMHC regulation covering conflict-of-interest.

8.15 Anti-Fraud, Waste, and Abuse

The CNMI has appropriate protocols in place to manage CDBG-MIT funds and to implement measures to prevent fraud, waste, and abuse of government funds. The CNMI, through NMHC, shall use existing protocols and resources to assist with the formulation of policies, procedures, and other program resources to effectively manage program funds.

NMHC will address fraud, waste, and abuse within the CDBG-MIT program in a variety of ways. Within the NMHC *CDBG-MIT Grant Compliance Policies and Procedures Manual*, the CNMI will address specific fraud, waste, and abuse issues including timesheet recording, travel, purchases, and accounting policies.

All discovered, suspected, or reported fraud, waste, and abuse within the CDBG-MIT program will be documented and reviewed. The disposition of the incident will be documented in a written decision. Any corrective or disciplinary actions will be carried out in conformance with the CNMI and NMHC rules and regulations. Suspected fraud shall be further investigated. When the suspected fraud involves a NMHC employee and internal investigation will initially be performed per established NMHC personnel regulations. Verified fraud activities by NMHC employees shall be referred to local law enforcement agencies. When the suspected fraud involves an individual or company outside the CNMI government investigations will be led by local law enforcement agencies. The CNMI, through NMHC, will forward any cases of fraud, whether suspected or verified, to the HUD office of Inspector General (OIG) at 1-800-347-3735 or hotline@hudoig.gov.

8.16 Grievance Policy: Disputes and Appeals

8.16.1 General Policy

The Northern Marianas Housing Corporation (NMHC) through the assistance of HUD will be responsible for responding to complaints and appeals in a timely and professional manner.

NMHC will keep a record of each complaint or appeal that it receives and it will include all communications and their resolutions.

(a) DISPUTES. Formal disputes [hereinafter referred to as "Disputes" interchangeably] are written complaints, including faxed and emailed statements, or letters that may result in an investigation. Disputes may be filed by any party involved in the application process, including the homeowner or building contractor. All disputes must be properly documented and timely adjudicated and resolved. An Applicant for funding for disaster recovery may appeal the disposition of the Application. Outlined below are some eligibility requirement examples but not limited to:

(i) A procedural error occurs where the Application was not processed by program staff in accordance with the guidelines established

(ii) The amount of funding for which the Applicant is eligible included exceeding caps.

(iii) Duplication of Benefits estimates

(iv) Affirmatively Furthering Fair Housing

(v) Construction issues

(vi) Other issues as necessary may be appealed to the NMHC Disputes must be in writing and filed in writing with the Office of the NMHC corporate director within five (5) business days after knowledge of the facts surrounding the dispute. NMHC must issue a formal response within fifteen (15) business days after a formal dispute is filed.

8.16.2 Responsibilities

NMHC will be tasked with handling all citizen inquiries. NMHC is responsible for:

(a) determining whether or not complaints and appeals relate to the business or authority of NMHC;

(b) ensuring that a response to all complaints and appeals are within the appropriate time frame (a response must be provided within 15 working days of the receipt of the complaint); and

(c) ushering all complaints and appeals through to a resolution. NMHC has established an internal procedure for handling incoming complaints, including a complaint escalation process, ensuring complaints are handled at the earliest stage in the process. If the issue is not resolved, it will be escalated to the NMHC Board of Directors. If no resolution is obtained at this stage, the issue will be escalated to HUD for final resolution.

8.16.3 Documentation

Documentation for each complaint or appeal must be maintained. Each file must include the following:

(a) Contact information for the complainant including a list of all parties involved;

(b) The date the complaint was received;

(c) Initial complaint;

(d) Address and assigned project number (if applicable);

(e) Any communications to and from complainant or appellant;

(f) Results of the investigation, together with any notes, letters, or other investigative documentation;

(g) The date the complaint or appeal was closed; and

(h) Any other action taken.

(i) Required documentation for formal complaints will include:

(i) A description of the complaint › The name of each person contacted in relation to the complaint

(ii) A summary of the results of the review or investigation of the complaint

(iii) An explanation of the reason the file was closed, if the file was closed upon receipt of a written complaint, the following steps will occur:

(1) A control number will be assigned to the complaint.

(2) Enter the complaint into a tracking system and maintain it as either an electronic or hard copy file.

(3) A review and/or investigation of the complaint will occur.

(j) A determination will be made as to which program the complaint refers.

(k) The findings will be submitted to an individual designated by the Program.

(l) Determine if the Complainant is an applicant, contractor or direct party

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APPENDIX A: MITIGATION PROJECTS NOT YET IMPLEMENTED

Source: Consultation with CNMI CIP. Bold projects align with priority mitigation areas identified in this plan.

Municipality	Project	Project Description	Total Cost	Duration
Saipan				
Saipan	Beach Road Improvement Project	Flood control and drainage project.	10,626,457	36 mos.
Saipan	Dandan Drainage Improvement Project	Flood control and drainage project.	2,585,620	36 mos.
Saipan	**Lower Base Road and** Drainage Improvement	**Improve the drainage system at Lower** Base area.	**2,152,000**	**19 mos.**
Tinian	**Tinian Seaport Office Back-up Generator**	**To ensure there is a back-up power source during** disasters in case of a power outage.	**360,000**	**14 mos.**
Tinian	Replacement of the Tinian Carolinas Village 0.50 MG Water Tank	To improve the water capacity for the island, and replace existing welded tank with more resilient concrete structure	5,180,000	27 mos.
Saipan	**Office of the Attorney General Mitigation Project (Susupe Office)** and Multi Purpose Center	**Install in a back-up generator to ensure power source in case of a disaster.**	**995,948**	**17 mos.**
Rota	Rota DFEMS Fire Station #9 Truck Bays	To effectively allow trucks to be properly positioned at the fire station.	900,000	16 mos.
Tinian	Roof Recoating of the Tinian Health Center	To harden the roofs from leaks.	159,000	9 mos.
Saipan	Smiling Cove Marina Embankment Mitigation	The objective of the proposed project action is to replace the existing concrete.	7,589,270	27 mos.
Saipan	Standby 25 kW Generator for Information Systems Unit Office with 25-	Procure and install a 25 kW backup generator with a 25-gallon built-in fuel tank to provide uninterrupted 24-hour power to the Judiciary office of information system.	52,000	13 mos.

	gallon built in fuel tank			
Saipan	**Kagman Community Shelter Project**	**Provide safe, secure and habitable long term-shelters for displaced residents during future typhoons and other natural disasters.**	**1,258,705**	**24 mos.**
Saipan	Roof Hardening Project	The proposed project will seal current cracks and openings in the roof, replace or repair built-up roof systems and recoat both.	814,780	17 mos.
Saipan	Facilities for Emergency Operations and Continuous Power Generation Fire Station # 1,2,4 & 5	Procure and install 100 kW back up power generator with 300-gallon fuel storage tank. Concrete/CMU generator enclosure will be constructed to protect generator and fuel tank	632,900	12 mos.
Saipan	Facilities for Emergency Operations and Continuous Power Generation Fire Station #2	Procure and install 100 kW back up power generator with 300-gallon fuel storage tank. Concrete/CMU generator enclosure will be constructed to protect generator and fuel tank.	-	12 mos.
Saipan	Facilities for Emergency Operations and Continuous Power Generation Fire Station #5	Procure and install 100 kW back up power generator with 300-gallon fuel storage tank. Concrete/CMU generator enclosure will be constructed to protect generator and fuel tank.	-	12 mos.
Saipan	Homeland Security And Emergency Management Emergency Operations Center Project	Harden Emergency Operations Center to protect critical equipment, provide back-up power and water to prevent loss of agency function or emergency services	1,883,100	24 mos.
Saipan	Facilities for Emergency Operations and Continuous Power Generation Fire Station #4	Procure and install 100 kW back up power generator with 300-gallon fuel storage tank. Concrete/CMU generator enclosure will be constructed to protect generator and fuel tank.	-	12 mos.
Saipan	Homeland Security and Emergency Management (HSEM)	Construct 200 ft. Emergency Communications Tower, Mt. Tapochau	1,203,267	12 mos.

	Communications Tower			
Saipan	Facilities for Emergency Operations and Continuous Power Generation	The goal of this application is to fund project is to fund will procure 50kW generator with electrical appurtenances necessary to connect power to the DOL office	430,200	19 mos.
Rota	Replacement of the Roll-up Doors at the Rota Aircraft Rescue and Fire Fighting Facility	The proposed project aims to mitigate the damages and hazards from strong winds, flying debris and wind-driven rain to the Rota ARFF emergency response vehicles, equipment and personal utilizing the truck bays	72,000	8 mos.
Saipan	Installation of Typhoon Shutters pm Doors and Windows at the Saipan International Car Rental Building	The proposed project considers the installation of new typhoon or wind shutters at the Saipan International Airport Car Rental Building located on Saipan	22,300	7.5 mos.
Saipan	Assessment, Capacity Building, and Property Acquisition and Risk Remediation Project	To support the Zoning Office in implementation of the Nuisance Abatement and Blighted Property Maintenance Act of 2018, this project proposal envisions conducting an assessment of blighted buildings including mapping of structures, blight classification, hazard identification, property ownership, and recommended remediation measures	601,490	36 mos.
Saipan	Assessment of Risk, Vulnerability and Disaster Bonding/Insurance Feasibility to Support Comprehensive Sustainable Development Planning and Disaster Risk Reduction	This project will support the Office of Planning and Development (OPD) in its mission to provide data-driven analysis, tools, and policies that support comprehensive sustainable development plan (Comprehensive Plan) for CNMI that ensures smart, safe development occurs to support socio-economic growth goals of the community.	807,380	

Tinian	Generator and Infrastructure Retrofit	Tinian Mayor Office generator and infrastructure retrofit project requires funding to equip two facilities on Tinian emergency power and water to operate as emergency facilities during disasters	566,000	19 mos.
Saipan	Outer Cove Improvement Project	The objective of the Proposed Project Action is to rebuild the Outer Cove Marina by reconstructing the protection along the northeast side of the harbor	14,149,870	21 mos.
Saipan	**Tanapag Youth Center Back-up Generator Project**	**The objective of this Hazard Mitigation Grant application is to install a new 60 KVA back-up generator with concrete housing at the Tanapag Youth Center. With This mitigation project, there will be a reduction** in the functional downtime of the facility	**251,400**	**17 mos,**
Saipan	**Tinian Medical Referral Guest House Back-up** Generator Project	**The Guest House provides necessary housing for Tinian patients, who have been medically referred to the CHC due to lack of treatment services at the Tinian Health Center. These medically referred patients from Tinian** often have to spend multiple days or months.	**325,400**	**18 mos.**
Saipan	Replacement of the Dandan Water Tank	There is a current risk of catastrophic failure of the water tank if another typhoon will hit area. Therefore, the objective of this Hazard Mitigation Grant application will be to replace the current tank	7,048,000	24 mos.
Saipan	Replacement of the Kagman Water Tank	There is a current risk of catastrophic failure of the water tank if another typhoon will hit area. Therefore, the objective of this Hazard Mitigation Grant application will be to replace the current tank	7,141,000	24 mos.
Saipan	Replacement of the Kannat Tabla Water Tank	There is a current risk of catastrophic failure of the water tank if another typhoon will hit area. Therefore, the objective of this Hazard Mitigation Grant application will be to replace the current tank	7,008,000	24 mos.
Saipan	Replacement of the Calhoun Water Tank	There is a current risk of catastrophic failure of the water tank if another typhoon will hit area. Therefore, the objective of this Hazard Mitigation Grant application will be to replace the current tank	4,047,000	22 mos.

Saipan	**Replacement of the As Matuis Water Tank**	There is a current risk of catastrophic failure of the water tank if another typhoon will hit area. Therefore, the objective of this Hazard Mitigation Grant application will be to replace the current tank	**7,232,000**	**24 mos.**
Saipan	Generator and Water Tank Project	The propose project will be a back-up generator and water tank	239,100	17 mos.
Saipan	Power Plant #1 Facility Repair and Mitigation	To Harden Power Plant #1	4,987,427	18 mos.
Saipan	Back-up Generator	Replacement of the current generator.	574,700	17 mos.
Saipan	Power Plant #4, Building Facility Repair and Mitigation Project	The main objective of this project is to provide power supply reliability to Power Plant 4 facility on the island through the project proposed repairs and replacement of historically damaged components and vulnerable equipment.	3,802,497	30 mos
Rota	Back-up Generator Fire Station #9	Provide a back-up generator to fire station #9 because it currently does not have one.	359,000	17 mos
Rota	Rota Power Plant Building Facility Repair and Mitigation Project	The main objective of this project is to provide power supply reliability to Power Plant facility on the island through the project proposed repairs and replacement of historically damaged components and vulnerable equipment.	865,745	
Saipan	Saipan Distribution Automation Project	The problem to be mitigated is the loss of electrical services to the electrical customers of Saipan and the public safety risk form electrocution	3,747,850	30 mos.

APPENDIX B: PRIORITY PROJECT ALIGNMENT WITH SELECTION CRITERIA

Island	Project	Primary Community Lifeline	Meets LMI National Objective	CDBG-MIT Project Priority
Mitigation Actions				
Saipan	Beach Road Drainage Improvement Project	Transportation	Yes	Priority 2
Saipan	Lower Base Road and Drainage Improvement	Transportation	Yes	Priority 2
Tinian	Replacement of the Tinian Carolinas Village 0.50 MG Water Tank	Food, Water, Shelter	Yes	Priority 1
Saipan	Replacement of the Dandan Water Tank	Food, Water, Shelter	Yes	Priority 1
Saipan	Replacement of the Kagman Water Tank	Food, Water, Shelter	Yes	Priority 1
Saipan	Power Plant #1 Facility Repair and Mitigation	Energy	Yes	Priority 1
Saipan	Kagman Community Shelter Project	Food, Water, Shelter	Yes	Priority 3
Mitigation Planning Projects				
Saipan, Tinian, Rota	Assessment of Risk, Vulnerability and Disaster Bonding/Insurance Feasibility to Support Comprehensive Sustainable Development Planning and Disaster Risk Reduction	Food, Water, Shelter Energy Transportation Health and Medical Communications	Yes	N/A – May address all or several priorities
Saipan, Tinian, Rota	Development of guidance and standards to determine costs and benefits of nature-based hazard mitigation actions in CNMI; NBI cost-benefit analysis solution.	Food, Water, Shelter Energy Transportation	Yes	N/A – May address all or several priorities

APPENDIX C: LIST OF ACRONYMS

A

AP	Action Plan
ARC	American Red Cross

B

BECQ	Bureau of Environmental & Coastal Quality

C

CDBG	Community Development Block Grant
CFR	Code of Federal Regulations
CHC	Commonwealth Health Center
CIP	Capital Improvement Program
CNMI	Commonwealth of the Northern Marianas Islands
CPA	Commonwealth Ports Authority
CPP	Citizen Participation Plan
CREST	Coastal Resilience Evaluation and Siting Tool
CRN	Crisis Response Network
CSDP	Comprehensive Sustainable Development Plan
CUC	Commonwealth Utilities Corporation

D

DCRM	Division of Coastal Resources Management
DEQ	Division of Environmental Quality
DFEMS	Department of Fire and Emergency Medical Services
DFW	Division of Fish and Wildlife
DHS	Department of Homeland Security
DOD	U.S. Department of Defense
DOI	U.S. Department of the Interior
DPW	Department of Public Works
DR	Disaster Recovery

E

ENSO	El Niño Southern Oscillation
EOC	Emergency Operations Center
EOP	Emergency Operations Plan
EPA	U.S. Environmental Protection Agency

F

FAA	Federal Aviation Administration (or Agency)

FEMA	U.S. Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FIS	Flood Insurance Studies

H

HM	Hazard Mitigation
HMA	Hazard Mitigation Assistance
HMGP	Hazard Mitigation Grant Program
HSEM	CNMI Homeland Security & Emergency Management Office
HUD	US Department of Housing and Urban Development

L

LEED	Leadership in Energy and Environmental Design
LMI	Low-to-Moderate-Income

M

MID	Most Impacted and Distressed
MIT	Mitigation
MRI	Mean Recurrence Interval

N

NASA	National Aeronautics and Space Administration
NBI	Nature-Based Infrastructure
NBS	Nature-Based Solutions
NEPA	National Environmental Protection Act
NFIP	National Flood Insurance Program
NMHC	Northern Marianas Housing Corporation
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service

O

OMB	Office of Management and Budget
OPD	CNMI Office of Planning and Development

P

PDAC	CNMI Planning and Development Advisory Council

S

SOP	Standard Operating Procedure
SSMP	Standard State Mitigation Plan

U

U.S.C.	U.S. Code
USACE	U.S. Army Corps of Engineers
USGS	U.S. Geological Survey