

INTRODUCTION

The number of state- and federally-declared disasters in Alaska has increased dramatically over the past seven decades, especially over the last 20 years, as in illustrated in the graph below. The majority of these disasters are caused by flooding and severe storms with flooding. Each year, these events put Alaskan communities at risk of loss of life and property. Recent studies indicate that the frequency and intensity of these storms is likely to increase, especially in the coastal regions of Alaska. The need for a sound approach to help communities become more resilient to natural disasters is more important now than ever. The Federal Emergency Management Agency (FEMA) Risk Mapping, Assessment and Planning (Risk MAP) Program provides Alaskan communities with the tools, resources and technical assistance they need to achieve greater disaster resilience.



Figure 4: Alaska Federally Declared Disasters, 1953-2024

Data Source: https://www.fema.gov/api/open/v2/DisasterDeclarationsSummaries.csv. Current as of September 30, 2024



In order for Alaska's communities to make informed risk management decisions, a consistent risk-based approach to identifying, assessing and planning for the mitigation of natural hazards is necessary. Recognizing the connection between reliable flood maps and flood damage is essential for protecting life and property in Alaska. This is the central purpose of Risk MAP: to provide communities with flood and other hazard information and tools they can use to enhance their local plans and better protect their citizens. Through more accurate flood maps, risk assessment tools, and outreach support, Risk MAP strengthens local ability to make informed decisions about reducing risk and becoming more disaster resilient.

Flood hazard maps produced by FEMA have been an important tool for flood hazard mitigation in Alaska's municipal governments that participate in the National Flood Insurance Program (NFIP). The State of Alaska and its local governments rely on FEMA flood hazard maps to regulate floodplain development and otherwise mitigate for flood losses. Flood hazard maps produced by FEMA currently serve 32¹ Alaska borough and city governments. Three of these cities are mapped but are currently suspended from the NFIP. Two cities and one borough are in the Emergency Phase of the NFIP and have no FEMA Flood Insurance Rate Maps (FIRM) or Flood Hazard Boundary Maps (FHBM).

Unlike many other states where local governments with flood hazards have long been identified and mapped, Alaska has 109² incorporated municipal governments (cities and boroughs) that have no FEMA FIRMs. No ordinances exist to regulate floodplain development in these cities and boroughs, nor are they eligible to receive federal flood insurance. As a result, federally-backed financial assistance may in some cases be withheld, impeding economic development opportunities. Many of these communities are highly flood-prone, resulting in costly State and federal disasters without the benefit of federal flood insurance.

Of those Alaska communities that do have FIRMs, the maps and data used to create them may be outdated. In many areas of the state, property owners have invested significant financial resources over the past 40 years to prove properties are not in floodplains as defined by FEMA. If nothing is done to improve these inaccurate maps, they will continue to cost property owners. Other property owners, who are at risk of flooding, may not be aware of their flood risk because their properties are incorrectly shown outside of the floodplains.

Alaska's floodplain mapping inventory includes many miles of mapped floodplains designated as "unnumbered A-Zones". These zones lack the engineering analysis and topographic detail needed to accurately show the floodplain. There are still a number of Alaska communities with maps that have never been updated.

¹ This includes 28 NFIP-participating borough and cities, the Cities of Kenai, Soldotna, and the City and Borough of Wrangell, that are suspended from the NFIP, and the City of Delta Junction, that withdrew from the NFIP.

² This includes the 106 cities and boroughs that do not participate in the NFIP, plus the 2 cities and 1 borough that participate in the NFIP but do not have FIRMs.



THE TRANSITION TO FEMA'S RISK MAP PROGRAM

In Federal Fiscal Year 2009, FEMA began the transition from its former mapping program, *Map Modernization*, to *Risk Mapping, Assessment, and Planning (Risk MAP)* with funding from the National Flood Insurance Fund and Congressional appropriations for flood hazard mapping. FEMA's goal for Risk MAP is to combine flood hazard mapping, risk assessment tools, and hazard mitigation planning into one seamless program. Risk MAP's overall vision is to work collectively with state, local, and tribal entities to deliver quality data that increases public awareness and leads to action that reduces risk to life and property. (FEMA, 2019).

The multi-year Risk MAP process can provide a suite of services -- ranging from public outreach, trainings, technical assistance, grant assistance, and mapping -- to support community priorities toward addressing vulnerabilities to natural hazards, utilizing Federal and State resources. Major outcomes of this process are updated Flood Insurance Rate Maps (FIRMs) and multi-hazard risk assessments, along with the identification of projects, funding, training opportunities, and technical assistance that result in hazard mitigation.

Risk MAP strengthens the ability of communities to make informed local decisions about reducing risk. The Risk MAP program includes collaboration with Federal, State, and local stakeholders in communities across the nation to identify, assess, communicate, and mitigate risks. The program aims to address gaps in flood hazard data, provide an enhanced digital platform for the information that is produced, and align risk analysis programs to enhance decision-making. Risk MAP works in conjunction with other FEMA initiatives and supports the NFIP in its efforts to encourage communities to become risk aware and resilient.

Pre-Disaster Mitigation Works

The value of efforts such as Risk MAP to reducing risk was highlighted by an independent 2017 study by the National Institute of Building Sciences, co-funded by FEMA. The study found that every \$1 the Federal Government invests in mitigation saves taxpayers an average of \$6 in future spending. This return on investment justifies new opportunities for FEMA and its partners to reduce future disaster costs and accelerate recovery by investing now, before a disaster occurs. FEMA's Federal Insurance and Mitigation Administration has adopted the findings of this study, and seeks to increase pre-disaster mitigation investments. As FEMA strives to bring a greater share of Federal dollars to bear on pre-disaster risks, the agency also educates and incentivizes its partners to increase their investments in pre-disaster mitigation. (National Institute of Building Sciences, 2017).



Alaska's Challenge

Alaska's enormous size is difficult to fathom. Alaska contains 586,412 square miles of land. The state is one-fifth the size of the Lower 48 states, two and one-half times larger than Texas, 488 times larger than Rhode Island, and larger than the next three larger states in the United States combined. As Figure 5 illustrates, Alaska end-to-end spans the distance from San Francisco, California to Jacksonville, Florida. Alaska has 6,640 miles of coastline, more than all other states combined.

While Alaska is the largest of the fifty states, it is also the most sparsely populated. Alaska's population density of 1.3 persons per square mile (*Health Resources and Services Administration*) ranks the lowest of the fifty states. The state population in 2023 was 736,812. (2023 DCCED Certified Population)



Figure 5: Alaska's Comparative Size

Due to Alaska's vast size and sparse population, the cost of acquiring high-resolution topographic data and mapping thousands of miles of floodplain seems a daunting endeavor. Planning-level estimates indicate Alaska needs millions of dollars to acquire high-resolution topographic data and additional millions to update the current mapping inventory and convert the data to a digital GIS format. Furthermore, Alaska's rural communities are traditionally viewed as having low risk from flooding relative to the state's more urbanized communities with much larger populations. Consequently, the level of resources historically dedicated to improving maps, particularly in rural communities, has been limited. However, disaster



statistics paint a different picture. As Figure 4 on page 5 shows, federally-declared disasters for flood and severe storm events in Alaska have more than doubled over the past two decades. Figure 33 (page 99) shows the vast majority of these events have taken place in the Bethel, Kusilvak and Yukon-Koyukuk census areas. These census areas are comprised of small, remote, predominantly Alaska Native communities. The communities are especially vulnerable as they are located in Alaska's vast unorganized borough where there is no borough form of government to provide services and other resources to address disaster events. Only 9 of the 87 Alaska Native villages within these three census areas participate in the NFIP. More than half of the villages within these census areas are ineligible to participate in the NFIP because they are not incorporated municipalities. Storm events increasingly put these communities at risk to loss of life and property. Recent studies indicate that the frequency and intensity of these storms is likely to increase, especially in western Alaska (Terenzi, 2014).

State and Federal agencies have been concerned about the impact of flooding and other natural hazards on the safety and viability of Alaska Native villages for some time. Government Accountability Office (GAO) studies conducted in 2003 and 2009 reported that 184, or 86 percent, of Alaska's 213 Alaska Native villages were affected to some degree by flooding and erosion, most commonly caused by severe storm events on Alaska's coast or by riverine flooding, such as during the spring breakup of river ice. The GAO identified 31 villages located throughout Alaska's riverine and coastal areas, which are imminently threatened by flooding and erosion. Of these villages, 12 were identified as exploring relocation options for all or a portion of the existing villages. Four of the 12 communities – Kivalina, Newtok, Shaktoolik and Shishmaref – were identified as needing to move the entire community as soon as possible.

The 2019 Statewide Threat Assessment found that 144 Alaska Native villages were at risk to some degree of infrastructure damage from erosion, flooding and permafrost thaw (UAF et al., 2019). Only 14 of these communities have completed risk assessments, and 11 have partially completed assessments (Antrobus et al., 2020). The map on page 10 shows the location of the 144 communities.

A critical challenge to Alaska's communities taking action to address their hazard issues is the glaring lack of available data. In June 2009, the Alaska Climate Change Sub-Cabinet's Research Needs Work Group reported:

"Native and long-time Alaskan residents describe dramatic changes in Alaska's climate and the chronic and catastrophic effects these changes are having on their lifestyles and cultures. Knowledgeable scientists, engineers, leaders, and decision-makers acknowledge that climatic changes are occurring in Alaska and have great potential, in consort with other factors, to adversely impact the natural, social, economic, and infrastructure systems that Alaskans rely upon for their way of life. Nearly everyone, however, unanimously laments the paucity of data, analyses, information infrastructure, and decision-support and sharing tools necessary for effective assessment and response to such changes."

It is very difficult for a community to know how to respond to environmental threats without clear



understanding and guidance on the nature of the threat, what the current and predicted impacts are, and what options there are to address the threat. Alaska Native villages that have made decisions about how to respond to environmental threats have relied upon studies of the threats to provide this guidance.



