



EXECUTIVE SUMMARY

Flood hazard maps produced by the Federal Emergency Management Agency (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 42 Alaska borough and city governments. Three of these communities are mapped but are currently suspended from the NFIP. Additionally, 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 120 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Of those Alaska communities that do have FIRMs, the maps and data used to create them may be outdated.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 have maps that have never been updated.

Significant to the state's mapping issues is the fact that Alaska is the only state lacking digital imagery and elevation data at nationally-accepted standards. The National Elevation Dataset (NED) has limited data for only a few of Alaska's participating NFIP communities. NED data are not available with sufficient accuracy for over 95% of the state. Consequently, Alaska has a substantial need to develop new science-based mapping.



TRANSITION FROM MAP MODERNIZATION TO RISK MAP

The FEMA Map Modernization (Map Mod) program, which operated from 2004 to 2009, began the process of updating floodplain maps in Alaska. The initial premise of Map Mod was to convert flood insurance rate maps (FIRMs) to digital geographic information system (GIS) formats. Floodplain data was migrated from old maps and overlaid on more easily readable photographic base mapping. This made the maps much easier to read, but did not improve the accuracy of the maps. Halfway through Map Mod, FEMA also decided to improve some of the scientific data requirements. However, due to budgetary constraints these improvements were inadequate to meet the needs of Alaska communities.

In Federal Fiscal Year 2009, FEMA began the transition from Map Mod to Risk MAP (Mapping, Assessment, and Planning) 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. FEMA's vision of Risk MAP has several components. These include:

- Identifying additional flood hazard data needs, and establishing a "life-cycle" approach to mapping updates,
- Conducting informative risk assessments for all watersheds in the nation, which should lead to more effective risk communication, flood mitigation planning, and flood risk reduction performance tracking,
- Ensuring hazard mitigation plans are assessed and updated every five years locally and every three years at the state level, and
- Keeping the nation's flood maps credible, enhancing their quality, and maintaining ease of data availability.

Risk MAP is an improved and integrated approach where flood hazards are identified and woven into watershed-based risk assessments and state and local mitigation planning efforts (FEMA, 2009). The intent of Risk MAP is to encourage beneficial partnerships and innovative uses of flood hazard and risk assessment data in order to maximize flood loss reduction. Risk MAP places new emphasis on enabling communities to carry data beyond flood policy applications to comprehensive risk assessments and better integration of risk information into local and state mitigation, emergency, and business plans.

The Risk MAP Program emphasizes bringing outdated and invalid flood studies into compliance with scientifically-proven methodologies, including re-delineating floodplain boundaries using high resolution topographic data. Risk MAP's primary objectives include:

- Assessing the nation's flood risk and using the information to increase public awareness of risk,



- Increasing public awareness of risk from natural hazards and establishing a baseline of local knowledge and understanding of risk management concepts, Ensuring 80% of the nation’s flood hazards are current including accurate and valid data, and
- Continuing to meet statutory requirements of the NFIP through assessing on a watershed basis, the need to revise and update all floodplain areas and flood risk zones identified, delineated, or established (FEMA, 2009).

The Risk MAP Program is designed to be implemented on a watershed scale starting with an overall evaluation of eight-digit U.S. Geologic Survey Hydrologic Unit Code (HUC-8) level watersheds. Alaska has multiple HUC-8 watersheds. In geographic terms, HUC-8 watersheds are typically smaller than an average Alaska borough. The HUC-8 watersheds in Alaska are large and consist of large amounts of Federal and State owned land and may incorporate communities that don’t participate in the NFIP. For example, the Upper Yukon HUC-8 consists of 60,000 square miles.

The State is supportive of using localized watersheds where the local NFIP-participating community identifies the mapping priorities within the local watershed. An example of this is the eastern side of the Upper Kenai Peninsula HUC-8 Watershed. Mapping priorities are focused on the NFIP participating community and its need for updated Flood Insurance Studies (FIS).

FEMA will use the new data acquired through the Risk MAP Program to not only improve its floodplain mapping inventory, but also to develop new interactive mapping products for communities to utilize when communicating risk. These products require accurate topographic and scientific studies. The FEMA business model quantifies cost versus risk levels to determine how to prioritize new and revised mapping. Historically, when this type of qualifying criteria is used, however, Alaska loses out to more densely populated areas of the country.

Since 2002, the Alaska Department of Commerce, Community, and Economic Development (Commerce), Division of Community and Regional Affairs (DCRA) has supported FEMA in the management of the Map Mod Program including local level coordination, outreach, and delivery of Map Modernization Products. DCRA completed 13 projects resulting in the completion of maps for a total of 118 communities. The projects were carried out in partnership with local entities such as boroughs and housing authorities, with leverage funds provided by the Denali Commission, Alaska Department of Transportation and Public Facilities, and the U.S. Department of Agriculture’s Office of Rural Development.

Under DCRA’s Fiscal Year 2009 Risk MAP Program, DCRA supported FEMA’s transition from Map Mod to Risk MAP through the development of a state business plan titled Alaska Mapping Business Plan: Integrating Mapping, Assessment, and Mitigation Planning , the predecessor to this document. This document, the 2014 Alaska Mapping Business Plan inventories existing data, establishes criteria for developing mapping



priorities, prioritizes mapping needs, and recommends future mapping action. The 2014 Alaska Mapping Business Plan supports FEMA’s efforts to address gaps in flood hazard data and increase public understanding of flood risks. DCRA’s Floodplain Management website also serves as a repository for data and resources to support community efforts to reduce flood risk.

Figure 1: Home on Kotzebue Sound

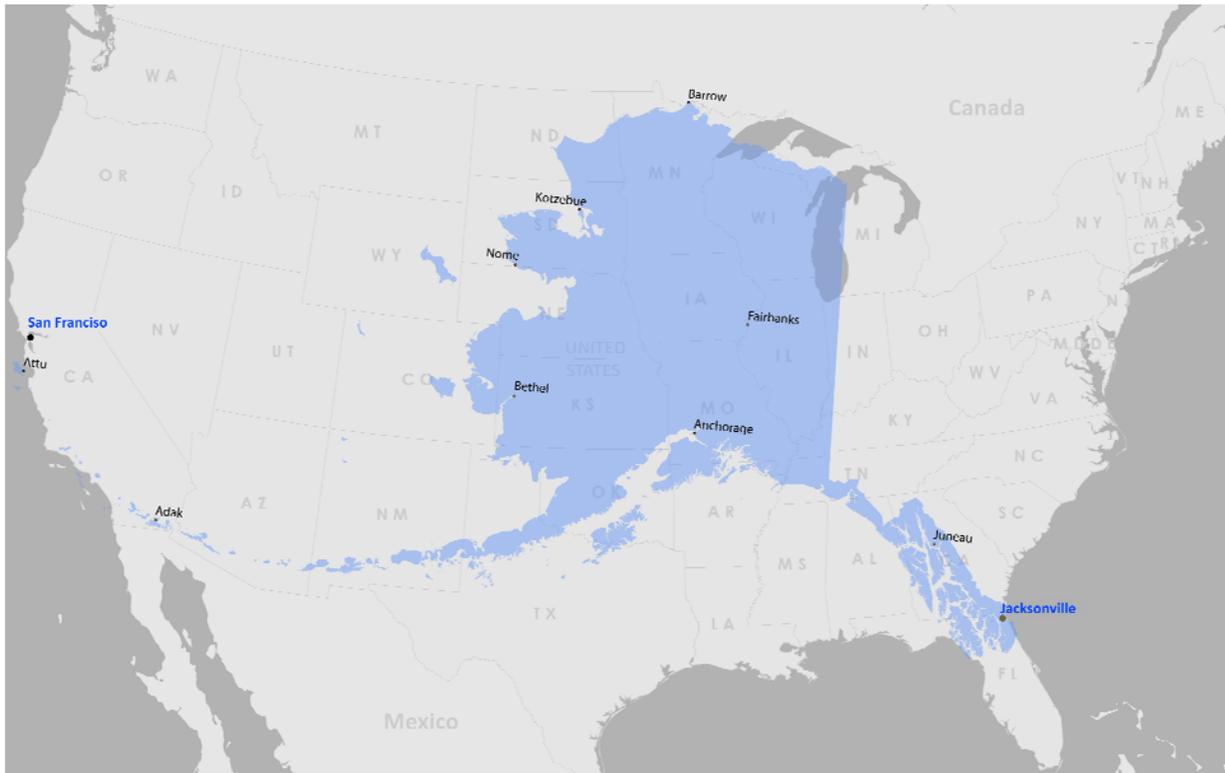




ALASKA'S CHALLENGE

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 2 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.

Figure 2: Alaska's Comparative Size



While Alaska is the largest of the fifty states, it is also the most sparsely populated. Alaska's population, at 710,231 in 2010, ranks the lowest of the fifty states, with a population density of 1.2 inhabitants per square miles (0.46/km²).

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.



Alaska is the only state in the nation that lacks digital imagery and elevation data at nationally accepted standards. The horizontal and vertical reference datums established by the National Spatial Reference System -- the North American Datum of 1983 (NAD83) and the North American Vertical Datum of 1988 (NAVD88) -- have been accepted as the standard for FEMA Risk MAP studies. However, in Alaska, the reference system does not have the density of control points to support sub-meter level accuracies for mapping and positioning activities. In the case of the vertical datum, NAVD88 does not provide coverage to most of the western half of the state. This has created a challenge to Alaska's coastal communities, in particular, who require accurate land elevations and water depths to regulate floodplains, build flood protection infrastructure, model storm surge, and monitor sea-levels.

During the Map Mod process, FEMA financed approximately \$5 million worth of modernization to the floodplain maps in 16 Alaska municipalities, five of which are currently in the post- preliminary map adoption stage. Assuming the Risk MAP Program will provide a similar level of funding, Alaska is still far short of what is needed to complete necessary mapping improvements.

ALASKA'S OPPORTUNITY

The need for high-resolution topography is not limited to floodplain mapping. High-resolution topography is a product sought by many organizations, from private enterprise to all levels of government. Many federal agencies benefit from high-resolution topographic data including the U.S. Department of Agriculture (USDA), U.S. Geological Survey (USGS), U.S. Army Corps of Engineers, the National Oceanic and Atmospheric Administration (NOAA) and FEMA. State agencies benefitting from improved floodplain mapping include Commerce, the Department of Military and Veteran's Affairs, and the Department of Natural Resources. Local governments participating in the NFIP, in particular, have much to gain for local residents.

DCRA and FEMA have collaborated over the past 25 years to reduce loss of life and property through strategies and programs that reduce natural hazard risk. As the designated State Coordinating Agency for the NFIP, DCRA has actively participated in studying the status of flood hazard mapping and making recommendations for updating or creating new maps. As both the State of Alaska Statewide Flood Hazard Map Modernization Plan (2002) and Alaska's Flood Map Modernization Plan (2008) documents illustrate, DCRA has actively engaged in FEMA's Map Mod Program during the past eight years.

DCRA is now looking to the future as a partner with FEMA in the execution of the Risk MAP Program. This document, Alaska Mapping Business Plan: Integrating Mapping, Assessment, and Mitigation Planning, represents a first step in comprehensively evaluating the status of Alaska's flood maps, setting priorities for future mapping, and outlining a collaborative relationship with FEMA to fully execute the Risk MAP strategy for the benefit of Alaska's communities, local governments, tribal entities, and residents.



The purpose of this document is to provide FEMA with Alaska’s strategy for floodplain mapping participation in the Risk MAP Program. The substantial investments FEMA is making in remapping large sections of Alaska could be leveraged by other government agencies to co-create greatly improved mapping that will benefit far more than just floodplain mapping programs. During the coming year this report will be circulated to state agencies, private sector organizations, non-profits entities, and political leaders for review and comment. As this process is completed, DCRA hopes to develop a plan that will lead to stronger support of FEMA’s mapping program and new financial commitments from other entities with vested interests in improving the accuracy of mapping in Alaska.

Figure 3: Tsunami and Coastal Flood-Elevated Home, Lowell Point, Kenai Peninsula Borough

