Alaska Mapping Business Plan:

Integrating Mapping, Assessment, and Mitigation Planning

September 2015

State of Alaska
Department of Commerce, Community,
and Economic Development
Division of Community and Regional Affairs

United States
Department of Homeland Security
Federal Emergency Management Agency
Region X

Alaska Department of Commerce, Community, and Economic Development; Division of Community and Regional Affairs
Planning and Land Management Section

Alaska Risk MAP Program
Sally Russell Cox, Local Government Specialist IV
Alaska CTP/Risk MAP Coordinator
Telephone: (907) 269-4588
Email: sally.cox@alaska.gov

FUNDED UNDER

Federal Emergency Management Agency Cooperating Technical Partners Program Partnership Agreement: EMW-2014-CA-00182

Photo Credit: Cover page photos provided complements of numerous agencies and photographers. Seward, Nenana, Nome, Cordova, Valdez, Shishmaref, and Kivalina photos provided by the Alaska Division of Community and Regional Affairs. Emmonak and Aniak photos provided by the Alaska Division of Homeland Security and Emergency Management Services. Eagle photos provided by *Fairbanks News Miner*. Galena photos courtesy of Ed Plumb, National Weather Service. Matanuska-Susitna Borough photos courtesy of Matanuska-Susitna Borough.

Table of Contents

Executive Summary **1**
Transition from Map Modernization to Risk MAP 2
Alaska's Challenge 5
Alaska's Opportunity 6

Introduction **8**

FEMA's Risk MAP Program **9**
Vision 10
Goals 10
Lifecycle 11
Implementation 12
Cooperating Technical Partners Program 12

The NFIP and Flood Hazard Mapping **14**
National Flood Insurance Program 14
Flood Hazard Mapping 15
Digital Flood Insurance Rate Maps and Geographic Information Systems 15
Coordinated Needs Management Strategy (CNMS) 16

Alaska's NFIP-Participating Local Governments **18**
NFIP Community Characteristics 22
Local Government 22
Population 22
Other Community Characteristics 24
FEMA Characteristics 25
Hazard Mitigation Plans 25
Cooperating Technical Partnerships 25
Community Rating System 26
Capacity to Regulate Land Use and Participate in Land Use Planning 28
GIS Capabilities 30
Alaska Flood Hazard Maps 31
Letters of Map Change (LOMC) 32
Current and Planned Alaska Flood Mapping Studies 35
Municipality of Anchorage 36

City of Aniak 37
City of Bethel 37
City of Cordova 38
City of Emmonak 41
Fairbanks North Star Borough 41
City of Homer 42
City and Borough of Juneau 44
Kenai Peninsula Borough 46
Ketchikan Gateway Borough 49
City of Kotzebue 52
City of Kwethluk 52
Matanuska-Susitna Borough 53
City and Borough of Sitka 56
City of Seward 59
City of Valdez 61
Mapping Issues in Alaska 65

DCRA: An Effective Cooperating Technical Partner 68

Alaska's Risk MAP Program 70
Role of the CTP Coordinator 70

Alaska Risk MAP Data Acquisition, Analysis and Prioritization of Future Study Needs 72
Alaska Mapping Data 72
State and Local Data 72
Community Specific Data Collection 72
Federal and Regional Data 74
Average Annualized Loss 74
Non-Average Annualized Loss 75
Census Data 75
Community Boundaries and Information 75
Data Comparison 75
Coordinated Needs Management Strategy (CNMS) data 77
Available Topography 78
Letters of Map Change (LOMC) 78
Mitigation Plans 78

Non-Compliance with the NFIP 79
Community Rating System (CRS) 79
Declarations 79
Federal Insurance Administration (FIA) 79
Hazard Mitigation Grant Program (HMGP) 79
Alaska Prioritization and Future Studies Sequencing Decision Support System 80
Overview 80
Acquired/Standardized Data 80
Data Processing 82
Area/Population Weighting 82
Considering Types of Data Inclusion – Rank vs. Binary 82
Risk Factor 83
Average Annualized Loss Rank 83
Population Rank 83
Needs Factor 83
Coordinated Needs Management Strategy (CNMS) 83
Coastal Miles 83
Topographic Coverage Rank 84
Community Identified Needs Rank 84
Climatological Change Rank 84
LOMC Rank 84
Planned Future Development Rank 84
Action Potential Factor 85
Mitigation Plan Rank 85
Interest in New Community Plans 85
Community Rating System Rank 85
Disaster Declarations Rank 85
Flood Insurance Administration Rank 85
Mitigation Grants Rank 85
In-House GIS Rank 86
Application of the Prioritization and Future Studies Sequencing Decision Support System 86
Adding Scenarios 87
Prioritization of Future Mapping Needs 90

Mapping Recommendations 96

Alaska Risk MAP Goals for the Coming Year 100
Program Management Statement of Work 100
State and Local Business Plans and/or Updates 100
Scope 100
Standards 100
Deliverables 101
Global Program Management 101
Scope 100
Standards 103
Deliverables 103
Global Outreach for Mapping 103
Scope 103
Standards 103
Deliverables 104
Minimum Map Printing 104
Scope 104
Standards 104
Deliverables 104
Coordinated Needs Management Strategy (CNMS) 104
Scope 104
Standards 104
Deliverables 104
Community Engagement and Risk Communication Statement of Work 105
Strategic Planning for Community Engagement 105
Scope 105
Standards 106
Deliverables 106
Meetings and Process Facilitation 107
Scope 107
Standards 108
Deliverables 108
Mitigation Support 108
Scope 108
Standards 109
Deliverables 109
Communication and Outreach to Communities 109

Scope 109
Standards 110
Deliverables 110
Training to State and Local Officials and Community Capability Development 110
Scope 110
Standards 111
Deliverables 111
Mitigation Planning Technical Assistance 112
Scope 112
Standards 113
Deliverables 114

References 115

List of Tables

Table 1. Risk MAP Program Goals 10

Table 2. Risk MAP Lifecycle 11

Table 3. NFIP Participating Communities in Alaska 21

Table 4: NFIP Local Government, Population and Population Change 23

Table 5. Other Community Characteristics 24

Table 6. FEMA Characteristics 26

Table 7. Flood and Erosion Characteristics 27

Table 8: NFIP Community Planning Capacity 29

Table 9: GIS Capabilities of NFIP Communities 30

Table 10: Letters of Map Change 33

Table 11. Flood Insurance Rate Maps (FIRMS) 34

Table 12: Cordova Project Status 39

Table 13: Homer Project Status 43

Table 14: Juneau Project Scope 44

Table 15: Juneau Project Status 46

Table 16: Kenai Peninsula Borough Project Status 49

Table 17: Ketchikan Project Status 52

Table 18: Desired Risk MAP Study Areas for the City of Kotzebue 53

Table 19: Matanuska-Susitna Borough Project Status 56

Table 20: Sitka Project Status 59

Table 21: Seward Project Status 61

Table 22: Valdez Project Status 64

Table 23: Current FEMA Flood Mapping Studies in Alaska 65

Table 24: NAVD88 Benchmarks in NFIP-Participating Communities..... 68

Table 25: Comparison of Data Sources on Alaska Communities..... 77

Table 26: Datasets Used in the Prioritization Process 82

Table 27: Ranking of Alaska's HUC-8 Watersheds Based on Scenarios 1-4 93

Table 28: NFIP Participating Communities by Ranked HUC-8 Watershed..... 95

Table 29: Priority Watersheds for Risk MAP Studies in 2014..... 97

Table 30: NFIP Communities Located in the Twenty-One Highest-Ranked Watersheds 98

List of Figures

Figure 1: Home on Kotzebue Sound 4

Figure 2: Alaska's Comparative Size 5

Figure 3: Tsunami and Coastal Flood-Elevated Home, Lowell Point, Kenai Peninsula Borough 7

Figure 4: Risk MAP Life Cycle 11

Figure 5: City of Nenana, 2008 Flood 17

Figure 6: NFIP Percentage of Alaska's Population in Organized and Unorganized Boroughs 19

Figure 7: NFIP Participating Boroughs and Cities 20

Figure 8: Current and planned Alaska Flood Mapping Studies 35

Figure 9: Flooding in the village of Aniak 37

Figure 10: Map of Cordova Project Scope 40

Figure 11: Widespread Flooding in Emmonak, May 2005 41

Figure 12: Map of City and Borough of Juneau Risk MAP Study Scope 45

Figure 13: Map of Kenai Peninsula Borough Coastal Project Scope 48

Figure 14: Map of Ketchikan Gateway Borough Coastal Study Scope 51

Figure 15: Map of Matanuska-Susitna Borough Study Scope 55

Figure 16: Map of Sitka Study Scope 58

Figure 17: Map of Valdez Study Scope 63

Figure 18: NAVD88 Published Stations in Alaska 66

Figure 19: Ice Jam Flooding in Galena, Spring 2013 70

Figure 20: Ice Jam on the Kenai River, 2007 72

Figure 21: Map of Rankings of Watersheds Based on Scenario 1 92

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 2015 Alaska Mapping Business Plan inventories existing data, establishes criteria for developing mapping

priorities, prioritizes mapping needs, and recommends future mapping action. The 2015 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

INTRODUCTION

In 2002, DCRA published the State of Alaska Statewide Flood Hazard Map Modernization Plan describing Alaska's vision for supporting multi-hazard flood Map Modernization, available and needed staff resources, and a corresponding funding plan for future mapping activities. Six years later (2008), DCRA published Alaska's Flood Map Modernization Plan, which provided an update of Map Modernization activities and detailed an action-oriented business plan for continued work in updating flood hazard maps. Since that time, significant progress has been made through FEMA's Map Modernization Program and DCRA's Community Mapping Program. However, data gathering and the prioritization scheme that formed the basis of both prior DCRA mapping business plans have not undergone a comprehensive update to reflect mapping progress during the past eight years. Consequently, mapping priorities identified in both plans do not reflect the current availability of mapping data, local socioeconomic conditions, natural hazard data, and climate change data as collected by various state and federal agencies.

FEMA manages several risk analysis programs that assess the impact of natural hazards and develop effective strategies for reducing risk. These programs support the United States Department of Homeland Security's objective to "strengthen nationwide preparedness and mitigation against natural disasters." During federal fiscal year (FY) 2009, FEMA transitioned from Map Mod to Risk MAP. While Map Mod focused on providing reliable and easily shared digital flood hazard data and maps, Risk MAP emphasizes advancing risk mapping, assessment, and planning work.

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 State of Alaska's 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 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.

The 2015 Alaska Mapping Business Plan provides a comprehensive approach for identifying and assessing Alaska's flood mapping needs, identifying and prioritizing Alaska's future flood mapping studies, 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.

FEMA'S RISK MAP PROGRAM

FEMA's flood hazard maps are one of the essential tools for flood hazard mitigation and implementation of the NFIP in the United States. These maps are used an estimated 20 million times annually in the private and public sectors. Lending institutions and insurance companies use them to identify who needs flood insurance and to determine flood insurance rates. Community planning officials, land developers, and engineers use them for designing new buildings and infrastructure to avoid flooding. Most importantly, states and communities use them for hazard mitigation planning and emergency management. Finally, federal agencies use them when implementing Executive Order 11988, Floodplain Management, which requires federal agencies to avoid short- and long-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative.

FEMA's Map Mod effort transformed the majority of the flood hazard mapping inventory to 21st century digital technology and restored confidence in the reliability of floodplain boundaries, while making some updates to underlying engineering data. Map Mod's large-scale overhaul of the nation's flood hazard maps included data collection and analysis, map production, product delivery, and program management activities. Once completed, Map Mod will provide reliable digital flood hazard data and maps for approximately 92% of the nation's population (FEMA, 2009).

The dynamic nature of floodplains requires ongoing analysis of flood hazards to maintain a reliable and valid data inventory. Failing to keep current with the changing and dynamic nature of watersheds ultimately leads to unwise decisions that place homeowners and communities at increased risk of flooding. Conversely, overstated hazards not based on accurate data can result in potentially unnecessary construction costs and incorrect insurance rating decisions. Accurate and reliable flood hazard information is a necessary component of ensuring the fiscal soundness of the NFIP.

In order to leverage the successes of Map Mod and further enhance the usability, value, and accuracy of flood hazard mapping and related data, FEMA developed the Risk MAP Strategy (or Program). Risk MAP represents a philosophical and tactical shift in how FEMA delivers information necessary for flood hazard reduction (FEMA, 2009). The focus has shifted from digitizing maps (Map Mod) to evaluating flood hazard data needs, meeting flood hazard data needs, expanding data availability, and improving data accessibility (Risk MAP).

As part of its activities related to the NFIP, FEMA began the transition from Map Mod to Risk MAP during federal fiscal year (FY) 2009. Risk MAP combines flood hazard mapping, risk assessment tools, and mitigation planning into one seamless program. It 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.

Vision

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. It also encourages informed risk management decisions and actions to mitigate risk through a consistent risk-based approach to assessing potential vulnerability and losses and providing the tools to communicate the message. By analyzing and illustrating flood risk, communities and the American public can better understand their risk and make informed decisions to reduce overall vulnerability (FEMA, 2009).

Goals

Risk MAP's primary objectives include: 1) assessing the nation's flood risk and using the information to increase public awareness of risk; 2) increasing public awareness of risk from natural hazards and establishing a baseline of local knowledge and understanding of risk management concepts; 3) ensuring 80% of the nation's flood hazards are current including accurate and valid data; and 4) 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).

Table 1. Risk MAP Program Goals

Goal	Description
1	Address gaps in flood hazard data to form a solid foundation for flood risk assessments, floodplain management, and actuarial soundness of the NFIP.
2	Ensure that a measurable increase of the public's awareness and understanding of risk management results in a measurable reduction of current and future vulnerability to flooding.
3	Lead and support states, local, and tribal communities to effectively engage in risk based mitigation planning resulting in sustainable actions that reduce or eliminate risks to life and property from natural hazards.
4	Provide an enhanced digital platform that improves management of limited Risk MAP resources, stewards information produced by Risk MAP, and improves communication and sharing of risk data and related products to all levels of government and the public.
5	Align Risk Analysis programs and develop synergies to enhance decision-making capabilities through effective risk communication and management.

Source: Risk Mapping, Assessment, and Planning (Risk MAP) Multi-Year Plan: Fiscal Years 2010 – 2014 (FEMA, 2009)

LIFECYCLE

The concept and progression of Risk MAP is best described as a "lifecycle" with the overall purpose of reducing losses to life and property. Flood hazard mapping is used for risk assessments, which are incorporated into mitigation plans where risk reduction measures are identified for future action.

Future hazard identification requirements are developed and the cycle starts anew. Risk MAP's lifecycle is comprised of three substantive areas including mapping, assessment, and planning (FEMA, 2008).

Figure 4. Risk MAP Lifecycle

Table 2. Risk MAP Lifecycle

Goal	Description
1	Focuses on the flood hazard data identification with a broader emphasis towards supporting Risk MAP data needs. By improving the data collection, maintenance, and delivery of data, FEMA
2	FEMA will describe the effects of hazards on people and built environment through effective, user-targeted products. FEMA will encourage more detailed, multi-hazard assessments from federal, state, and local partners. Additionally, FEMA will improve the ability to assess future conditions and built environments (through state/local plans) to help measure the potential reduction in risk through probabilistic and scenario-based analysis. Ultimately,
3	Demonstrated progress in state, tribal, and local mitigation plans to fully utilize Risk MAP products that are timely, targeted, and accurate. Mitigation plans rely on risk assessment information for communities to analyze, incorporate into plan updates, and identify actionable strategies that reduce risks. Success is dependent upon effective risk communications, incentives, and guidance across federal, state, and local levels to encourage

Source: FEMA's Risk MAP Strategy – Integrating Mapping, Assessment, and Mitigation Planning (FEMA, 2008)

Implementation

A cornerstone of FEMA's Risk MAP Program is collaborating with state, local, and tribal entities to reach program goals. In administering the Risk MAP Program, FEMA utilizes mapping partners to update flood hazard data and maps. FEMA will also rely on local communities, regional entities, tribes, and state agencies to ensure updated information is used in making informed decisions regarding planning, community development, and hazard mitigation. FEMA has developed seven primary strategies for implementing the Risk MAP Program including:

- Study Prioritization
- Elevation Data Acquisition
- Watershed Approach
- Engineering and Mapping
- Risk Assessment
- Mitigation Planning Support
- Risk Communication

Cooperating Technical Partners Program

Central to FEMA's Risk MAP Program is collaboration and cooperation established by mapping partnerships with state, local, and tribal entities to update flood hazard data and maps. The Cooperating Technical Partners (CTP) Program is an innovative approach to creating these partnerships between FEMA and participating local communities, regional entities, tribes, and state agencies that have the interest and capability to become more active participants in the FEMA flood hazard mapping program.

The purpose of the CTP Program is to provide, through a Cooperative Agreement, funds to ensure that the CTP entity can perform program management and technical mapping-related activities. Each participating CTP community enters into an agreement with FEMA to do certain mapping projects documented in mutually agreed upon Mapping Activity Statements (MAS). In addition to the State of Alaska, participating CTP communities in Alaska include the Municipality of Anchorage, the City and Borough of Juneau, the Matanuska Susitna Borough, and the Fairbanks North Star Borough.

There are several beneficial reasons for partnering with state, tribal, local, and regional organizations to produce Digital Flood Insurance Rate Maps (DFIRMs) under the NFIP:

- The data used for local permitting and planning will also be the basis for the DFIRMs, facilitating more efficient floodplain management;

- The CTP Program provides the opportunity to interject a tailored, local focus into a national program; thus, where unique conditions may exist, the special approaches to flood hazard identification that may be necessary can be taken;
- The partnership mechanism provides the opportunity to pool resources and extend the productivity of limited public funds; and
- For participating in the CTP Program, community partners will receive Community Rating System (CRS) credits, which may lead to discounted flood insurance premiums for property owners.

The following are fundable program management activities under the CTP Program:

- State and Local Business Plans and/or updates (required);
- Managing Technical Mapping Activities (required where technical activities are funded);
- Outreach;
- Providing training to state and local officials;
- Staffing;
- Pilot Projects (as defined by the FEMA Regional Office);
- Mentoring;
- Minimal Map Panel Printing (up to $5,000 must not be covered under another FEMA grant program already); and
- Coordinated Needs Management Strategy (CNMS) data collection/population.

In support of the CTP Program, FEMA has committed to do the following:

- Recognize the contributions made by FEMA's state, tribal, regional, and local
- partners by providing timely and accurate flood hazard information;
- Maximize the use of partner contributions as a means of leveraging limited public
- funds to the fullest extent while maintaining essential NFIP standards;
- Provide training and technical assistance for partners when appropriate; and
- Facilitate mentoring to increase capability for both existing and potential partners.

The NFIP and Flood Hazard Mapping

National Flood Insurance Program

In 1968, Congress created the NFIP to help provide a means for property owners to financially protect themselves. The Flood Insurance and Mitigation Administration (FIMA), a component of FEMA, manages the NFIP. The NFIP includes three primary components: 1) flood insurance; 2) floodplain management; and 3) flood hazard mapping.

Nearly 20,000 communities across the United States and its territories participate in the NFIP by adopting and enforcing floodplain management ordinances to reduce future flood damage. In exchange, the NFIP makes federally-backed flood insurance available to homeowners, renters, and business owners in these communities. Of noteworthy importance, community participation in the NFIP is voluntary.

Flood insurance is designed to provide an alternative to disaster assistance to reduce the escalating costs of repairing damage to buildings and their contents caused by floods. Flood damage is reduced by nearly $1 billion a year through communities implementing sound floodplain management requirements and property owners purchasing of flood insurance. Additionally, buildings constructed in compliance with NFIP building standards suffer approximately 80% less damage annually than those not built in compliance.

Joining the NFIP is a large benefit to local residents due to low-cost flood insurance, but it is also a large responsibility for municipalities. To participate in the NFIP, local governments agree to complete the following:

- Adopt and enforce a flood damage prevention ordinance;
- Require permits for all types of development in the floodplain;
- Assure building sites are reasonably safe from flooding;
- Estimate flood elevations that were not determined by FEMA;
- Require new or improved homes to be elevated above Base Flood Elevation (BFE);
- Require other buildings to be elevated or flood-proofed;
- Conduct field inspections and city violations;
- Require Elevation Certificates to document compliance;
- Carefully consider variances;
- Resolve non-compliance and violations; and
- Advise FEMA when updates to flood maps are needed

Flood Hazard Mapping

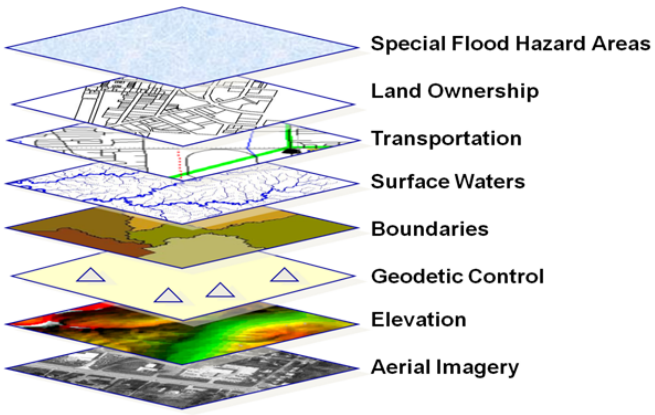
In addition to providing flood insurance and reducing flood damages through floodplain management regulations, the NFIP identifies and maps the nation's floodplains. Mapping flood hazards creates broad-based awareness of the flood hazards and provides the data needed for floodplain management programs and to actuarially rate new construction for flood insurance. These maps are Flood Insurance Rate Maps, commonly referred to as FIRMs. Each NFIP community should have or be in the process of having FIRMs for their community.

Communities regulate the floodplain for a variety of reasons, but some of the most important reasons include: 1) protect people and property; 2) ensure federal flood insurance and disaster assistance is available; 3) save tax dollars; 4) avoid liability and litigation; and 5) reduce future flood losses. Participation in the NFIP is based on an agreement between a local government and the federal government. If a community adopts and enforces a floodplain management ordinance that meets program standards, the federal government will make flood insurance available within the community at a low cost.

Digital Flood Insurance Rate Maps and Geographic Information Systems

The NFIP is adopting new digital products, including Geographic Information System (GIS)-based products. This plan will allow the continued use of paper maps. However, for NFIP stakeholders interested in adopting the new digital processes, this initiative will enable them to take full advantage of the new digital maps FEMA is producing through the (legacy) Map Mod and Risk MAP programs. FEMA's goal is to transition to digital processes for distributing and reading the flood maps. These new digital capabilities of the flood maps will:

- Enable significant advantages in capability, precision, and cost;
- Reduce costs associated with paper map production, handling and storage;
- Encourage the use of quality local data to make administration of the NFIP more efficient and effective.



The Standard Digital Flood Insurance Rate Map (DFIRM) Database is a digital version of the FEMA flood insurance rate map that is designed for use with digital mapping and analysis software. DFIRM Databases have been completed for a number of communities and counties throughout the nation. FEMA designed the DFIRM Database product to be used with (GIS) software.

GIS software allows users to access, view, and analyze mapping information using specialized data. The Standard DFIRM Database is designed to provide the user with the ability to determine the flood zone, base flood elevation and the floodway status for a particular location. It also has NFIP community information, map panel information, cross section and hydraulic structure information, Coastal Barrier Resource System information (if applicable), and base map information like road, stream, and public land survey data.

Coordinated Needs Management Strategy (CNMS)

The CNMS is a FEMA initiative to update the way FEMA organizes, stores, and analyzes flood hazard mapping needs information for communities. It defines an approach and structure for the identification and management of flood hazard mapping needs that will provide support to data driven planning and the flood map update investment process in a geospatial environment. CNMS tracks the lifecycle of needs, specifying opportunities to capture needs and proposing methods for their evaluation to inform the planning process.

From a technical perspective, the CNMS establishes a geospatially enabled effective means for users to enter, monitor, and update their inventory of needs. The basic structure of the database is two containers: one to store information about why and where effective studies are “broken”, and the other to record community concerns and requests. All information can be displayed simultaneously because they are geo-referenced.

The goal of the CNMS is to define the validity of the engineering study data, at the stream level, within the communities mapped. Participating communities coordinate with the FEMA Regional Office to have all flooding source centerlines included in CNMS and to have every segment contained in the CNMS stream network defined as valid, invalid, or in progress. The intent of having this information is to define the mapping need of each engineering study, determine the validity of the engineering study, and time-stamp the engineering study. Overall, FEMA wants to establish a national baseline record of New, Validated or Updated Engineering (NVUE) reporting geospatially that will influence future program production planning activities.

Through the CNMS, FEMA is evaluating its inventory of stream and coastal miles nationwide and establishing which miles meet NVUE. FEMA has committed to the US Congress that 80% percent of the miles in its inventory will meet this standard. Currently, based on a countywide evaluation of NVUE data, FEMA estimates that 51% of its inventory is compliant with NVUE nationwide. To reach 80%, FEMA will restudy 183,000 miles of stream or coastline nationwide during Risk MAP. CNMS is in its infancy, and the data will be updated over the next year, based on a on a stream reach-by-stream-reach and coastal-reach-by -coastal-reach evaluation of its inventory. This will cause the current estimate of NVUE-compliant miles to change.

In order to be compliant with NVUE quality standards, a stream must be digital (modernized) and be characterized by one of the following:

- A new detailed study, or
- A new approximate study based on topography, or
- An old detailed study that has been updated, or
- An old approximate study that has been updated.

The initial CNMS database is being created at a national level by FEMA headquarters and its contractors. Since CNMS is going to play such an important role in prioritization, it is essential that this database is built properly. It must be maintained and updated frequently to assure accuracy and to demonstrate the appropriate levels of need.

As noted in the section on the *Alaska Prioritization and Future Studies Sequencing Decision Support System* (page 72) the CNMS data for Alaska currently shows that all stream miles are Non-NVUE compliant, thus all watersheds have been given the same rank for this indicator in the decision support system. Additionally, FEMA's contractor STARR indicated that the only streams currently included in CNMS for the State of Alaska are those currently in DFIRM format. This excludes a large number of streams and makes this dataset incomplete. When the CNMS data is updated and some distinctions between the watersheds can be made, this indicator can be introduced to the algorithm at that time. Ultimately, CNMS should contribute heavily to the Needs factor in DCRA's decision support system (see page 77).

Figure 5: City of Nenana, 2008 Flood

Alaska's NFIP-Participating Local Governments

Floods have been, and continue to be, a destructive natural hazard in terms of economic loss to Alaska's local governments and the residents that live in these communities. Flooding is of great concern in Alaska because there are more than 3,000 rivers, over 5% of Alaska's land area is covered with glaciers, and more than 40,000 miles of coastline provide a multitude of opportunities for flooding. Unfortunately, residents of many flood-prone Alaskan communities do not have flood insurance even though they may live near water. Sixty-six[1] of Alaska's 162 incorporated communities do not participate in the NFIP.

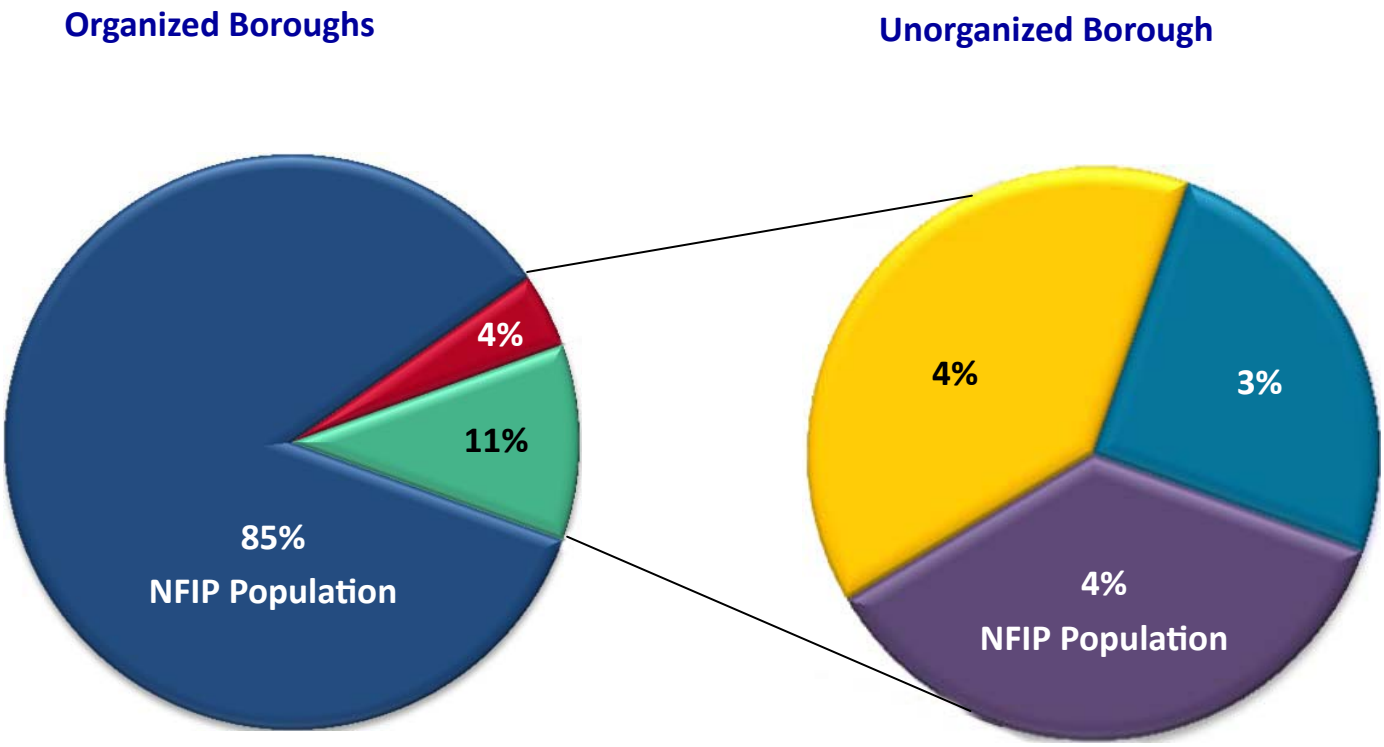
Slightly more than one-third (34 percent) of Alaska's 162 incorporated municipalities participate in the NFIP. In addition to the 32 NFIP-participating cities and boroughs, 24 cities located within the jurisdictional boundaries of participating boroughs enjoy the benefits of NFIP participation. Three municipalities (2 percent) participate in the NFIP (Kenai, Soldotna, and Wrangell) but are considered "suspended" and thus are not eligible for federal flood insurance.

It is noteworthy; however, that the majority of Alaska's population resides within the 56 communities that participate in the NFIP. As Figure 6 illustrates on the following page, 89 percent of Alaska's population participates in the NFIP. Eighty-five percent of the state population residing in organized boroughs participates in the NFIP, and four percent of the population residing in cities in the unorganized borough participates in the NFIP.

Figure 7, page 20, provides a map identifying the locations of the eleven boroughs and twenty-one cities that participate in the NFIP. Table 3, page 21, provides a listing of the 11 boroughs and 21 cities participating in the NFIP. Table 10 in Appendix 3 provides a more detailed overview of NFIP-participating communities by population and from of government, including individual communities within boroughs.

[1] This includes the 3 communities, Kenai, Soldotna, and Wrangell, that are suspended from the NFIP.

Figure 6: NFIP Percentage of Alaska's Population in Organized and Unorganized Boroughs



- Organized Boroughs: NFIP Population (602,434)
- Organized Boroughs: Non-NFIP Population (29,648)
- Unorganized Borough: NFIP Population Cities (28,125)
- Unorganized Borough: Non-NFIP Population Cities (30,403)
- Unorganized Borough: Non-NFIP Unincorporated Communities (19,621)

Total State Population: 710,231 (2010 Census)

Eleven boroughs and 21 cities participate in the NFIP. The location of these municipalities is shown on the map in Figure 7, below.

Figure 7: NFIP Participating Boroughs and Cities

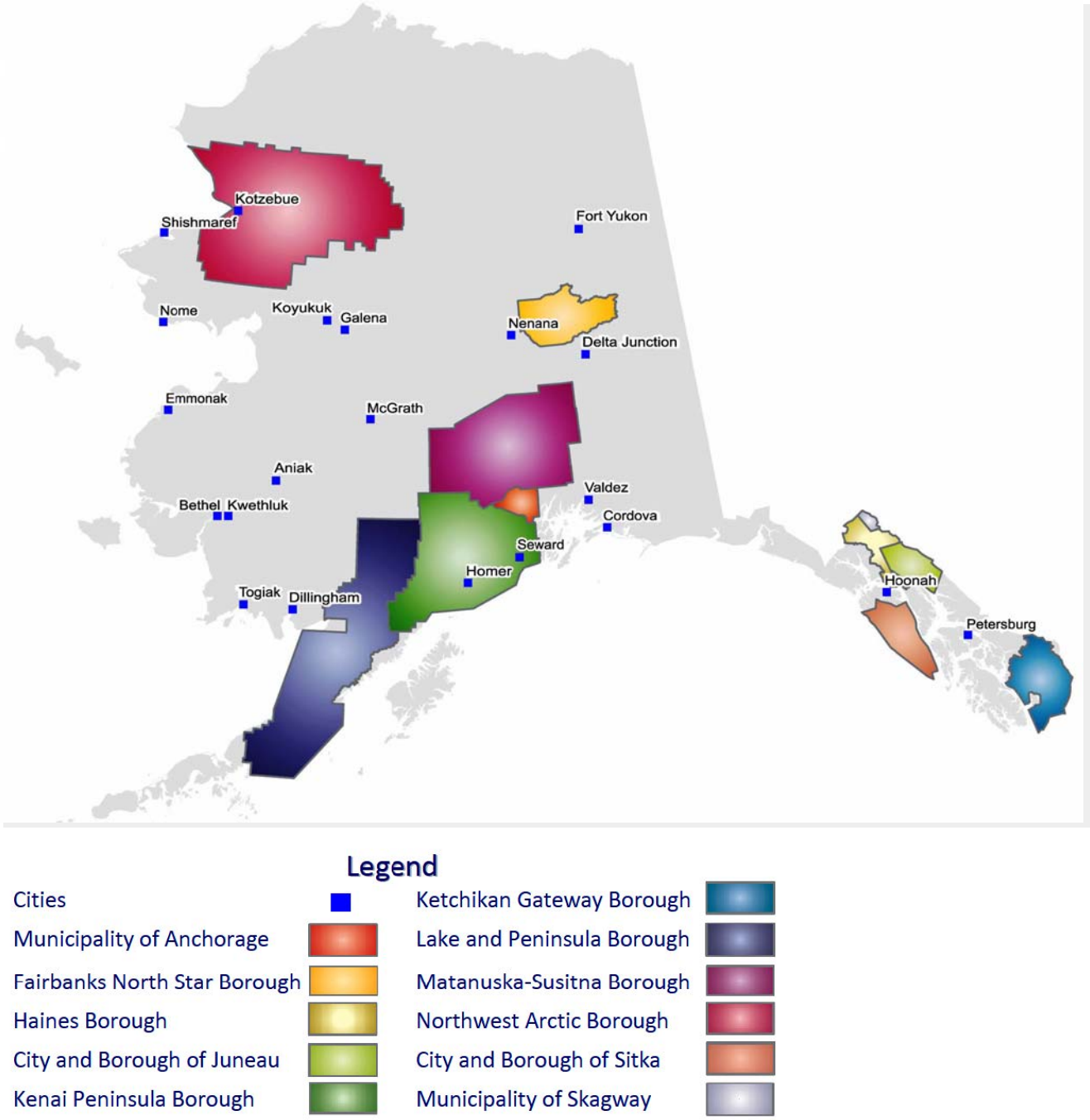


Table 3. NFIP Participating Communities in Alaska

Community Participation	NFIP Participant	Municipal Govt.	#Communities	%
Suspended - In Program	City of Aniak	21 cities	56	34.5%
	City of Bethel			
	City of Cordova			
	City of Delta Junction			
	City of Dillingham			
	City of Emmonak			
	City of Fort Yukon			
	City of Galena			
	City of Homer			
	City of Hoonah			
	City of Kotzebue			
	City of Koyukuk			
	City of Kwethluk			
	City of McGrath			
	City of Nenana			
	City of Nome			
	City of Petersburg			
	City of Seward			
	City of Shishmaref			
	City of Togiak			
	City of Valdez			
	Municipality of Anchorage	11 Boroughs plus 24 Cities located within the boundaries of the 11 Boroughs		
	Fairbanks North Star Borough			
	Haines Borough			
	City and Borough of Juneau			
	Kenai Peninsula Borough			
	Ketchikan Gateway Borough			
	Lake and Peninsula Borough			
	Matanuska-Susitna Borough			
	Northwest Arctic Borough			
	City and Borough of Sitka			
	Municipality of Skagway			
Suspended - In Program	City of Kenai	3 Cities - suspended	3	2%
	City of Soldotna			
	City of Wrangell			
Not in Program	11 First Class Cities, 85 Second Class Cities, 1 Home Rule City, 3 Home Rule Boroughs, and 3		103	63.5%
Total			162	100%

NFIP Community Characteristics

The average population of a NFIP-participating community is 19,279 residents (2010). Compared to all Alaska municipalities, NFIP municipalities are generally more urban or semi-urban in character, have larger populations, experience less dramatic population swings, have higher per capita income, and lower poverty rates.

Local Government

Thirty-four percent of NFIP-participating communities are borough governments; 66% are city governments. Of the 21 NFIP city government participants, the majority are not located within an organized borough government. In other words, these communities are without a regional form of governments.

Population

As municipalities that are enrolled in the NFIP tend to be more urban in character, they have also experienced slightly less dramatic population swings during the 2000 to 2010 time period. Most NFIP-participating communities have increased in population over the past ten years. On average, NFIP participants grew 2% from 2000 to 2010. Population growth has ranged from .2% (City of Shishmaref) to 50% (Matanuska-Susitna Borough). During this same time period, fifteen NFIP participating communities declined in population. Population decline ranged from -.7% (City of Emmonak) to -30.4% (City of Galena). In total, nearly half (47%) of NFIP participants experienced population losses during the 2000 to 2010 period. The rural and urban population change divide among NFIP communities remains consistent with statewide trends, with rural NFIP participants generally experiencing greater population losses than the urban NFIP communities.

Table 4. NFIP Local Government, Population and Population Change

NFIP Participant	Type	Unorganized Borough	2010 Population	2000-2010 Population Change
Municipality of Anchorage	Unified Home Rule Municipality	No	291,826 12	12.1%
Fairbanks North Star Borough	2nd Class Borough	No	97,581 17	17.8%
Haines Borough	Home Rule Borough	No	2,508 4	4.8%
City and Borough of Juneau	Unified Home Rule Municipality	No	31,275	1.8%
Kenai Peninsula Borough	2nd Class Borough	No	36,441	11.5%
Ketchikan Gateway Borough	2nd Class Borough	No	13,477	-4.2%
Lake and Peninsula Borough	Home Rule Borough	No	1,631	-10.5%
Matanuska-Susitna Borough	2nd Class Borough	No	88,995	50.0%
Northwest Arctic Borough	Home Rule Borough	No	4,322	4.4%
City and Borough of Sitka	Unified Home Rule Municipality	No	8,881	0.5%
Municipality of Skagway	1st Class Borough	No	968	6.7%
City of Aniak	2nd Class City	Yes	501	-12.4%
City of Bethel	2nd Class City	Yes	6,080	11.1%
City of Cordova	Home Rule City	Yes	2,239	-8.8%
City of Delta Junction	2nd Class City	Yes	958	14.0%
City of Dillingham	1st Class City	Yes	2,329	-5.6%
City of Emmonak	2nd Class City	Yes	762	-0.7%
City of Fort Yukon	2nd Class City	Yes	583	-2.0%
City of Galena	1st Class City	Yes	470	-30.4%
City of Homer	1st Class City	Yes	5,003	26.8%
City of Hoonah	1st Class City	Yes	760	-11.6%
City of Kotzebue	2nd Class City	Yes	3,201	3.9%
City of Koyukuk	2nd Class City	Yes	96	-5.0%
City of Kwethluk	2nd Class City	Yes	721	1.1%
City of McGrath	2nd Class City	Yes	346	-13.7%
City of Nenana	Home Rule City	Yes	378	-6.0%
City of Nome	1st Class City	Yes	3,598	2.7%
City of Petersburg	Home Rule City	Yes	2,948	-8.6%
City of Seward	Home Rule City	Yes	2,693	-4.8%
City of Shishmaref	2nd Class City	Yes	563	0.2%
City of Togiak	2nd Class City	Yes	817	1.0%
City of Valdez	Home Rule City	Yes	3,976	-1.5%
Average			**7,759**	**44.6%**

Other Community Characteristics

NFIP participants are located either on Alaska's coast (25%) or on rivers (38%). Some NFIP communities are coastal and riverine (38%). Compared to all Alaska municipalities, NFIP participants have significantly higher rates of households with adequate plumbing – including both piped water and wastewater utilities. Only four communities are without piped water and wastewater: Delta Junction, Koyukuk, Kwethluk, and Shishmaref. NFIP participants range in total quantity of local housing units from 55 (Koyukuk) to 107,332 (Municipality of Anchorage) housing units. On average, NFIP participants have 7,428 housing units.

Table 5. Other Community Characteristics

NFIP Participant	Coastal or Riverine	Sewer	Water	2000 HH W/O Plumbing	Watering Point	Community Well	Honey Bucket Pit	Honey Bucket Haul	Housing Units
Municipality of Anchorage	Both	Yes	Yes	1	No	Yes	No	No	107,332
City of Aniak	River	Yes	No	15	Yes	Yes	Yes	No	166
City of Bethel	River	Yes	Yes	10	Yes	Yes	No	No	1,896
City of Cordova	Both	Yes	Yes	3	No	No	No	No	922
City of Delta Junction	River	No	No	4	No	Yes	No	No	377
City of Dillingham	Both	Yes	Yes	7	No	Yes	No	No	855
City of Emmonak	River	Yes	Yes	12	Yes	No	No	No	185
Fairbanks Northstar	River			7					36,441
City of Fort Yukon	River	No	Yes	54	Yes	Yes	Yes	Yes	246
City of Galena	River	Yes	Yes	37	Yes	Yes	No	Yes	190
Haines Borough	Both			16					1,149
City of Homer	Coastal	Yes	Yes	4	No	No	No	No	2,235
City of Hoonah	Coastal	Yes	Yes	4	No	No	No	No	305
City and Borough of Juneau	Both	Yes	Yes	1	No	Yes	No	No	12,187
Kenai Peninsula Borough	Both			7					22,161
Ketchikan Gateway	Both			2					5,305
City of Kotzebue	Coastal	Yes	Yes	7	No	No	Yes	No	1,007
City of Koyukuk	River	No	No	100	Yes	Yes	Yes	No	55
City of Kwethluk	River	No	No	100	Yes	Yes	Yes	No	199
Lake and Peninsula	Both			14					553
Matanuska-Susitna	River			8					31,824
City of McGrath	River	Yes	Yes	8	Yes	No	No	No	213
City of Nenana	River	Yes	Yes	5	Yes	Yes	No	No	210
City of Nome	Both	Yes	Yes	5	No	Yes	No	Yes	1,356
Northwest Arctic Borough	Both			22					1,919
City of Petersburg	Coastal	Yes	Yes	2	No	No	No	No	1,367
City of Seward	Both	Yes	Yes	1	No	Yes	No	No	1,058
City of Shishmaref	Coastal	No	No	96	Yes	No	No	Yes	148
City and Borough of Sitka	Coastal	Yes	Yes	1	No	No	No	No	3,545
Municipality of Skagway	Both	Yes	Yes	6	No	Yes	No	No	436
City of Togiak	Coastal	Yes	Yes	38	Yes	Yes	No	No	221
City of Valdez	Coastal	Yes	Yes	2	No	Yes	No	No	1,645

FEMA Characteristics

Several programs administered and funded by FEMA work in concert with Risk MAP to achieve the goals and objectives of the Risk MAP Program. These programs, and the participation in them by Alaska's NFIP communities, are discussed in the following sections.

Hazard Mitigation Plans

FEMA-funded Hazard Mitigation Plans (HMPs) form the foundation of a community's long-term strategy to reduce disaster losses and break the cycle of disaster damage, reconstruction, and repeated damage. HMPs are community-driven, living documents that communities use to reduce their vulnerability to hazards. The plan and its process show the link between land-use decisions and vulnerability. The HMP serves as a tool to be used by planners or other officials to advise and inform decision makers.

State, Indian Tribal, and local governments are required to develop a hazard mitigation plan as a condition for receiving certain types of non-emergency disaster assistance, including Hazard Mitigation Grants.

Hazard Mitigation Plans are significant to the Risk MAP Program because one of the goals of Risk MAP is to lead and support states, local, and tribal communities to effectively engage in risk-based mitigation planning. Risk MAP products can provide crucial information to communities to analyze, incorporate into their HMP updates, and identify actionable strategies that reduce risks. The majority of Alaska's NFIP-participating communities have adopted a local hazard mitigation plan. (See Table 6, page 26).

Cooperating Technical Partnerships

As noted earlier, the CTP Program is the means through which FEMA's Risk MAP Program is implemented. While DCRA implements the State of Alaska's Risk MAP Program through a Cooperating Technical Partnership with FEMA, Alaska's local governments have the opportunity to enter into Cooperating Technical Partnerships with FEMA for mapping projects taking place within their jurisdictional boundaries.

Each participating CTP community enters into an agreement with FEMA to do certain mapping projects documented in mutually agreed upon Mapping Activity Statements (MAS). Community partners will receive Community Rating System credits (see next section), which may lead to discounted flood insurance premiums for property owners.

Four NFIP-participating communities have CTP agreements with FEMA including: the Municipality of Anchorage, Fairbanks North Star Borough, City and Borough of Juneau, and the Matanuska- Susitna Borough. (See Table 6, page 26).

Community Rating System

The Community Rating System (CRS) is a voluntary incentive program of the National Flood Insurance Program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. As a result, flood insurance premium rates are discounted to reflect the reduced flood risk resulting from the community actions meeting the three goals of the CRS: reducing flood losses; facilitating accurate insurance rating; and promoting the awareness of flood insurance. Currently five NFIP-participating communities take part in the CRS: the Municipality of Anchorage, Kenai Peninsula Borough, City of Nome, City of Seward, and City of Valdez. (See Table 6, below).

Table 6. FEMA Characteristics

NFIP Participant	Hazard Mitigation Plan	Hazard Mitigation Plan Year	CTP Agreement	CTP Agreement Year	CRS Community
Municipality of Anchorage	Yes	2011	Yes	1999	Yes
City of Aniak	Yes	2005	No		No
City of Bethel	Yes	2008	No		No
City of Cordova	Yes	2013	No		No
City of Delta Junction	Yes	2011	No		No
City of Dillingham	Yes	2008	No		No
City of Emmonak	Yes	2008	No		No
Fairbanks North Star Borough	No	In Process	Yes	2004	No
City of Fort Yukon	Yes	2010	No		No
City of Galena	Yes	2010	No		No
Haines Borough	Yes	2010	No		No
City of Homer	Yes	2005	No		No
City of Hoonah	Yes	2010	No		No
City and Borough of Juneau	Yes	2012	Yes	2004	No
Kenai Peninsula Borough	Yes	2005	No		Yes
Ketchikan Gateway	No		No		Yes
City of Kotzebue	Yes	2008	No		No
City of Koyukuk	Yes	2008	No		No
City of Kwethluk	Yes	209	No		No
Lake and Peninsula	Yes	2009	No		No
Matanuska-Susitna	Yes	2008	Yes		No
City of McGrath	Yes	2009	No		No
City of Nenana	Yes	2010	No		No
City of Nome	Yes	2008	No		Yes
Northwest Arctic Borough	Yes	2009	No		No
City of Petersburg	Yes	2008	No		No
City of Seward	Yes	2005	No		Yes
City of Shishmaref	Yes	2010	No		No
City and Borough of Sitka	Yes	2010	No		No
Municipality of Skagway	Yes	2009	No		No
City of Togiak	Yes	2010	No		No
City of Valdez	Yes	2008	No		Yes

Information on flooding and erosion data in Alaska's communities is limited and oftentimes inaccurate. Floods have been recorded in more than half (56%) of NFIP-participating communities. In the past ten years, over half (53%) of NFIP communities have also experienced a federally declared disaster.

Table 7. Flood and Erosion Characteristics

NFIP Participant	Flood Recorded	Most Recent Flood Event	Flood of Record Year	Worst Flood Event Year	Flood Insurance Study	Flood Gauge	AK Baseline Erosion Assessment	2000-10 Fed Declared Disasters
Municipality of Anchorage	Yes	1986			Yes	No	Minimal Erosion	1
City of Aniak	Yes	1991		1971	Yes	Yes	Monitor Conditions	2
City of Bethel	Yes	1991		1988	Yes	No	Monitor Conditions	3
City of Cordova	Yes	1995			Yes	No	Priority Action	1
City of Delta Junction	Yes	2004			Yes	No	Monitor Conditions	0
City of Dillingham	Yes	1980		1929	Yes	No	Priority Action	0
City of Emmonak	Yes	2009	1989	1972	Yes	Yes	Priority Action	3
Fairbanks Northstar		2008/09			DK	DK	Borough, Not rated	2
City of Fort Yukon	Yes	2009		1949	Yes	Yes	Monitor Conditions	1
City of Galena	Yes	2013	1971		Yes	No	Monitor Conditions	0
Haines Borough	Yes			1976	Yes	No	Monitor Conditions	0
City of Homer	Yes	1994	1966		Yes	No	Monitor Conditions	2
City of Hoonah	Yes	1992			Yes	No	No Erosion Issues	0
City and Borough of Juneau	Yes	1981			Yes	No	Minimal Erosion	0
Kenai Peninsula Borough	Yes	2014			DK	DK	Borough, Not rated	2
Ketchikan Gateway Borough					DK	DK	Borough, Not rated	0
City of Kotzebue	Yes	1990			Yes	No	Monitor Conditions	2
City of Koyukuk	Yes	1989	1963		No	No	Monitor Conditions	3
City of Kwethluk	Yes	2009	1972		No	Yes	Monitor Conditions	0
Lake and Peninsula					DK	DK	Borough, Not rated	0
Matanuska-Susitna	Yes	2013			DK	DK	Borough, Not rated	2
City of McGrath	Yes	1991	1972		No	No	Priority Action	1
City of Nenana	No		2008		Yes	No	Monitor Conditions	0
City of Nome	No				Yes	No	Monitor Conditions	0
Northwest Arctic Borough					DK	DK	Borough, Not rated	2
City of Petersburg					Yes	No	No Erosion Issues	2
City of Seward	Yes	2014			Yes	No	Monitor Conditions	0
City of Shishmaref	Yes	1989	1973		No	No	Priority Action	2
City and Borough of Sitka					Yes	No	Minimal Erosion	2
Municipality of Skagway					Yes	No	Minimal Erosion	0
City of Togiak	Yes		1964		No	Yes	Minimal Erosion	0
City of Valdez					Yes	No	Monitor Conditions	1

Capacity to Regulate Land Use and Participate in Land Use Planning

Alaska's Constitution confers broad authority on its local governments. Unlike many states that have centralized planning departments that regulate land use, Alaska State Law requires that planning, platting and land use regulation is carried out by Alaska's incorporated municipalities: home rule, first and second class boroughs, unified municipalities, and first class and home rule cities outside of boroughs. All other classes of municipalities (second class cities) may, but are not required to, exercise these powers. If a second class city is located within the unorganized borough, it has the option but not the duty to exercise planning, platting, and land use regulation within the boundaries of the city. Nine Alaskan cities participating in the NFIP fit into this category.

Alaska's local government structure and the authority vested in those local governments is significant to the implementation of the NFIP, because the ability to regulate land use is necessary for participation in the NFIP. The unorganized borough is not a municipal corporation; thus the State of Alaska has no legal authority to mandate planning, platting and land use regulation in second class cities or in unincorporated communities in the unorganized borough. Second class cities in the unorganized borough have the option, not the duty, to address development in the floodplain. Because there is no legal basis for land use regulation in Alaska's unincorporated communities, there is no authority to implement any compliance with the NFIP standards. Consequently, only a portion of Alaska's communities are eligible to participate in the NFIP.

Although NFIP participants must have planning and zoning authority, not all actively regulate land use within their jurisdictional boundaries. Table 8 (next page) shows the level of planning capacity for Alaska's NFIP participant communities.

Emmonak, Fort Yukon, Koyukuk, Shishmaref, and Togiak do not actively regulate land use or participate in land use planning. Ten NFIP-participating communities report not having a planning and zoning commission: Aniak, Delta Junction, Emmonak, Fort Yukon, Galena, Koyukuk, Kwethluk, Nenana, Shishmaref, and Togiak. The communities that are not actively engaged in land use planning are also not part of an organized borough; thus there is no regional entity regulating land use.

Fortunately, all NFIP communities are generally engaged in community planning as evidenced by having a community plan adopted; however, type and quantity of community plan widely vary. The majority (59%) of NFIP participants have a paid staff planner. Half (50%) also have in-house GIS capacity; however, no NFIP participants report having a paid cartographer.

Table 8: NFIP Community Planning Capacity

NFIP Participant	Planning & Zoning Powers	Planning & Zoning Commission	Zoning Map	Community Plan	# Community Plans	Comprehensive Plan	Land Use Plan	Planner	GIS Tech	Cartographer	GIS Capacity
Municipality of Anchorage	Yes	Yes	Yes	Yes	8	5	1	Yes	Yes	No	Yes
City of Aniak	Yes	No	DK	Yes	3	1		No	No	No	No
City of Bethel	Yes	Yes	Yes	Yes	8	3		Yes	Yes	No	No
City of Cordova	Yes	Yes	Yes	Yes	5	3		Yes	Yes	No	Yes
City of Delta Junction	Yes	Yes	DK	Yes	5	1		Yes	No	No	Yes
City of Dillingham	Yes	Yes	DK	Yes	10	7	2	Yes	Yes	No	No
City of Emmonak	No	No	No	Yes	2			Yes	Yes	No	No
Fairbanks North Star Borough	Yes	Yes	Yes	Yes	8	1	2	Yes	Yes	No	Yes
City of Fort Yukon	No	No	No	Yes	3	2		No	Yes	No	No
City of Galena	Yes	No	Yes	Yes	3	1		No	Yes	No	No
Haines Borough	Yes	Yes	Yes	Yes	4	2		Yes	Yes	No	Yes
City of Homer	Yes	Yes	Yes	Yes	8	3		Yes	Yes	No	No
City of Hoonah	Yes	Yes	DK	Yes	4	1	2	Yes	Yes	No	No
City and Borough of Juneau	Yes	Yes	Yes	Yes	13	3	4	Yes	Yes	No	Yes
Kenai Peninsula Borough	Yes	Yes	Yes	Yes	8	3		Yes	Yes	No	Yes
Ketchikan Gateway Borough	Yes	Yes	Yes	Yes	5	3		Yes	Yes	No	Yes
City of Kotzebue	Yes	Yes	DK	Yes	4	2		Yes	No	No	No
City of Koyukuk	No	No	No	Yes	2	1		Yes	No	No	No
City of Kwethluk	Yes	No	DK	Yes	3	1		Yes	No	No	No
Lake and Peninsula	Yes	Yes	Yes	Yes	5			Yes	Yes	No	Yes
Matanuska-Susitna	Yes	Yes	Yes	Yes	7	3		Yes	Yes	No	Yes
City of McGrath	Yes	Yes	DK	Yes	1			No	Yes	No	No
City of Nenana	Yes	No	DK	Yes	1	1		No	Yes	No	No
City of Nome	Yes	Yes	Yes	Yes	5	2		Yes	Yes	No	Yes
Northwest Arctic Borough	Yes	Yes	Yes	Yes	4	1		Yes	Yes	No	Yes
City of Petersburg	Yes	Yes	Yes	Yes	7	2		Yes	Yes	No	Yes
City of Seward	No	No	Yes	Yes	3	2	1	No	Yes	No	Yes
City of Shishmaref	No	No	No	Yes	10			Yes	Yes	No	No
City and Borough of Sitka	Yes	Yes	Yes	Yes	16	3	3	Yes	Yes	No	Yes
Municipality of Skagway	Yes	Yes	Yes	Yes	9	2	4	No	No	No	Yes
City of Togiak	No	No	No	Yes	3			No	No	No	No
City of Valdez	Yes	Yes	Yes	Yes	1	1		Yes	Yes	No	Yes

GIS Capabilities

GIS in-house capacity will enable Alaskan NFIP communities to participate in the new digital mapping program. GIS capacity includes trained staff as well as hardware and software and data that is available within a municipality. Of Alaska's 163 municipalities, only 19 have in-house GIS capacity. Sixteen of these communities participate in the NFIP:

Table 9: GIS Capabilities of NFIP Communities

Community	NFIP	Non-NFIP
City and Borough of Juneau	X	
City and Borough of Sitka	X	
Haines Borough	X	
Kenai Peninsula Borough	X	
Ketchikan Gateway Borough	X	
Kodiak Island Borough		X
Lake and Peninsula	X	
Matanuska-Susitna	X	
Municipality of Anchorage	X	
Municipality of Skagway	X	
North Slope Borough		X
Northwest Arctic Borough	X	
Fairbanks North Star Borough	X	
City of Cordova	X	
City of Nome	X	
City of Petersburg		X
City of Valdez	X	
City of Seward	X	
City of Delta Junction	X	

Alaska Flood Hazard Maps

Flooding is responsible for millions of dollars of property damage each year. The State of Alaska averages approximately $2.3 million per year in disaster costs for flood-related emergency costs. Most of the flooding that occurs in Alaska results from rainfall, snowmelt, and ice jams restricting stream channels and backing up flow; tsunamis, earthquakes, and coastal storms also cause flooding. Unique to Alaska, 750 glacier-dammed lakes have been identified causing concern regarding dam failure. If a glacier ice dam fails, lake water is released resulting in downstream flooding called outburst flooding. The rapid melting of snow during volcanic eruptions, tsunamis, and coastal storms can also cause unanticipated flooding (Miller, 2008).

Flood hazard maps produced by FEMA have been one of the primary tools for flood hazard planning for Alaska's city and borough governments, specifically those that participate in the NFIP. Alaska's local governments and the State of Alaska rely on FEMA flood hazard maps to regulate floodplain development and otherwise mitigate for flood loses. FEMA flood hazard maps currently serve 43 Alaska borough and city governments; three of these communities are mapped, but have been suspended from the NFIP. These communities have city governments that have failed to adopt ordinances to regulate development in the mapped flood hazard areas.

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 city and borough governments that have no FEMA flood hazard maps. Furthermore, no ordinances exist to regulate floodplain development. These cities and boroughs do not have the availability of federal flood insurance and federally-backed financial assistance may be withheld, stymieing economic development opportunities. Many of these same communities are flood-prone resulting in costly state and federal disasters without the benefit of federal flood insurance. FIRMs are available through FEMA and are on the Web at the FEMA Map Service Center at: https://msc.fema.gov/portal

FIRMs are useful in a variety of ways to many persons and agencies. Private citizens and insurance brokers use the FIRM to locate properties and buildings in flood insurance risk areas. Community officials use the FIRM to administer floodplain management regulations and to mitigate flood damage. Lending institutions and federal agencies use the FIRM to locate properties and buildings in relation to mapped flood hazards, and to determine whether flood insurance is required when making loans or providing grants following a disaster for the purchase or construction of a building.

FIRMS should be updated continuously but this costs time and money that often is hard to find. Some of the FIRMs are close to 30 years old. Average age of firms is around 16 years; half of the maps are over 20 years old. FEMA, the State of Alaska, and NFIP communities are working to update maps as resources allow.

DCRA, as the designated State-Coordinating Agency for the NFIP, has historically assumed responsibility for the floodplain mapping program as well as producing community profile maps for smaller communities that include best available flood and erosion information. In recent years, DCRA has also assumed responsibility for providing digital flood hazard maps to FEMA for new communities entering the NFIP. The work has largely been completed via community profile map contractors.

As illustrated by Table 11 on page 34, three NFIP-participating communities do not have a FIRM: the Cities of Koyukuk and Kwethluk, and the Northwest Arctic Borough (with the exception of the City of Kotzebue, which participates in the National Flood Insurance Program on its own). Of those NFIP participants with FIRMS, the number of panels range from 1 (Cordova, Delta Junction, McGrath, and Nenana) to 9,855 (Matanuska-Susitna Borough). The number of maps with Letters of Map Change (LOMC) range from zero to eight (Fairbanks North Star Borough). Firm map age ranges from less than one year to 33 years old (Skagway).

Letters of Map Change (LOMC)

A LOMC is a letter which reflects an official revision to an effective FIRM. LOMCs are issued in place of the physical revision and republication of the effective map. The number of LOMCs submitted can indicate that a FIRM may need revision. Table 10 on the following page summarizes the number and status of LOMCs submitted by NFIP participating communities. More detailed information on LOMCs submitted by Alaska's NFIP participating communities may be found in Table 8 on page 36 of Appendix 1.

Table 10: Letters of Map Change

Community Name	Active	Closed	Completed	Inactive	Suspended	Withdrawn
Municipality of Anchorage	5	2	147	2	18	
City of Bethel			4		1	
City of Cordova		1	4			
Fairbanks Northstar Borough	8	7	119	5	39	
City of Homer			1		1	
City of Hoonah					1	
City and Borough of Juneau		5	49	1	10	
Kenai Peninsula Borough			21		5	
Ketchikan Gateway Borough	1		5			
Matanuska-Susitna Borough	1	4	80	5	17	26
City of Nenana		2	1			
City of Petersburg			7		1	
City of Seldovia			2		1	
City of Seward			1		1	
City and Borough of Sitka			4		1	1
City of Valdez		1	1		1	
City of Wrangell			1		1	
TOTAL	**15**	**22**	**447**	**13**	**98**	**27**

*Current as of January 2012

Table 11: Flood Insurance Rate Maps (FIRMS)

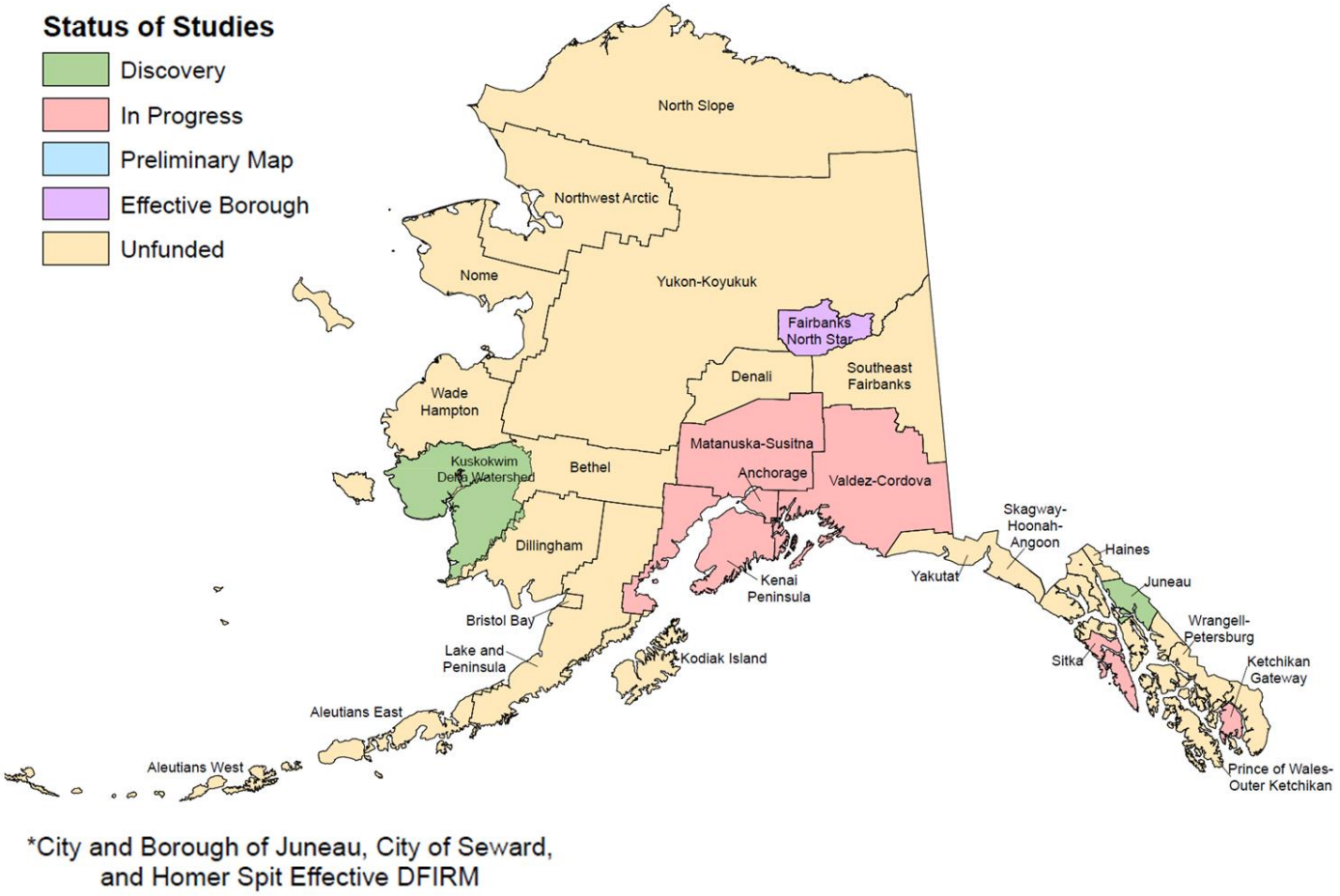
Community Name	FIRM	# FIRM Printed Panels	# FIRM Panels	Initial FIRM Date	Revised FIRM Date	FIRM Map Age	FIRM Effective Date	# Maps w/ LOMCs*
*Municipality of Anchorage	Yes	94	1975	5-Sep-79	18-Sep-87	0.6	25-Sep-09	3
City of Aniak	Yes	5	80	5-Sep-78	29-Sep-06	3.6	29-Sep-06	0
City of Bethel	Yes	8	64	28-Jun-74	15-Feb-85	0.6	25-Sep-09	0
City of Cordova	Yes	1	1	24-May-77	2-Apr-79	31.2	2-Apr-79	1
City of Delta Junction	Yes	1	1	25-Oct-77	16-Sep-82	27.7	16-Sep-82	1
City of Dillingham	Yes	4	20	31-May-74	12-Dec-75	27.7	30-Sep-82	
City of Emmonak	Yes	3	40	21-Sep-98	25-Sep-09	0.6	25-Sep-09	
Fairbanks North Star Borough	Yes	29	400	25-Jun-69	17-Mar-14	.6	17-Mar-14	8
City of Fort Yukon	Yes	7	37	3-Feb-10		0.29	3-Feb-10	
City of Galena	Yes	2	10	12-Oct-82	1-Mar-84	26.2	1-Mar-84	
Haines Borough	Yes	3	3	31-May-74	1-May-87	23.1	1-May-87	
City of Homer	Yes	8	6335	19-May-81	6-Nov-13	.9	6-Nov-13	
City of Hoonah	Yes	3	35	7-Jun-74	14-Jan-77	-0.04	4-Jun-10	
City and Borough of Juneau	Yes	12	1050	9-May-70	19-Aug-13	1.1	19-Aug-13	7
Kenai Peninsula Borough	Yes	30	6372	127-Sep-13		1	27-Sep-13	7
Ketchikan Gateway Borough	Yes	2	2	9-May-78	16-Apr-90	20.1	16-Apr-90	2
City of Kotzebue	Yes	2	30	21-Jun-74	23-Jan-76	26.9	18-Jul-83	
City of Koyukuk	Yes							
City of Kwethluk	Yes							
Lake and Peninsula Borough	Yes	5	175	3-Feb-10		0.29	3-Feb-10	
Matanuska-Susitna Borough	Yes	96	9855	28-Feb-78	4-Dec-79	25.1	1-May-85	9
City of McGrath	Yes	1	1	#-Oct-11				
City of Nenana	Yes	1	1	9-Jun-72	9-Apr-76	11.1	7-Apr-89	1
City of Nome	Yes	7	130	28-Jun-74	9-Aug-77	0.05	3-May-10	
Northwest Arctic Borough	Yes							
Petersburg Borough	Yes	5	16	14-Jun-74	4-Feb-77	28	1-Jun-82	1
City of Seward	Yes	4	4	27-Sep-13		1	19-May-81	1
City of Shishmaref	Yes	3	75	23-Aug-01	3-May-10	0.05	3-May-10	
City and Borough of Sitka	Yes	15	1550	28-Jun-74	12-Sep-75	28	1-Jun-82	1
Municipality of Skagway	Yes	2	2	1-Mar-77		33.2	1-Mar-77	
City of Togiak	Yes	5	350	3-Feb-10		0.29	3-Feb-10	
City of Valdez	Yes	28	115	1-Nov-74	3-Sep-80	26.5	1-Dec-83	
*Current as of 2012								

Current and Planned Alaska Flood Mapping Studies

As of September 2015, sixteen local governments have been recipients of FEMA-funded flood studies which are being initiated, underway, or recently completed. Four of these studies were begun under the Map Modernization Program and the remainder are Risk MAP studies. The studies range from LiDAR acquisition to physical map revisions. Summaries of these projects are provided in the following pages and in Table 22 on page 64.

From 2014 to 2015, the State of Alaska, FEMA, and FEMA's federal contractor conducted Risk MAP Discovery meetings with the Matanuska-Susitna Borough, the Municipality of Anchorage, the City and Borough of Sitka, Ketchikan Gateway Borough, and the City and Borough of Juneau. The purpose of the Discovery process is to gather information, review mitigation plans, and meet face-to-face with communities to better understand local flood risk and mitigation efforts. This process helps communities identify areas at risk for flooding and develop strategies for reducing that risk in collaboration with FEMA and the State. The communities participating in the Discovery process identified areas for future Risk MAP studies based on local priorities. The map below illustrates the status of current and planned mapping studies.

Figure 8: Current and Planned Alaska Flood Mapping Studies



Municipality of Anchorage

FEMA and the State of Alaska are conducting a Risk MAP Study in the Municipality of Anchorage (MOA) that began in 2013. The following non-regulatory activities are currently underway:

Avalanche Risk Methodologies

MOA has an existing analysis of avalanche risk; however a more detailed analysis is desired. Information will be provided about assessments and methodologies used by other communities. Available data will provided that can support an updated avalanche risk assessment.

Earthquake Risk Assessment

As a part of preparation for the Alaska Shield Exercise in 2014, FEMA Region X collected building stock and infrastructure data from MOA. As part of the Risk MAP project FEMA will create a detailed earthquake risk assessment using Hazus, a loss estimation software. The results will be given to MOA for use in prioritizing mitigation actions and targeting community outreach. FEMA will also review the existing Downtown Seismic Risk Assessment to determine if any assistance or resources can be provided to mitigate the identified risks.

Flood Study Priorities

Flood study needs and priorities for the flood sources impacting MOA will be documented in a report that FEMA can use as funding becomes available for additional riverine flood insurance studies. The report will address the following topics:

1. Vertical Datum – document the steps needed for MOA to transition to the use of NAVD88 and any outside assistance needed to make the transition.
2. LiDAR – document existing LiDAR and other topographic data, including details on data quality, and determine areas where future LiDAR acquisition is desired.
3. Re-delineation – document issues with previous re-delineations of Special Flood hazard Areas.
4. New Flood Studies – document flooding sources in MOA and prioritize areas for new flood insurance studies.
5. Levee Policy – document levees in MOA and the impact on flood studies based on FEMA’s Levee Policy.
6. Wildfire Outreach

Future outreach opportunities will be determined and further issues explored related to wildfire risk and insurance.

In addition to the new Risk MAP study discussed above, there are two outstanding/pending flood studies

in the MOA:

- A Physical Map Revision incorporating new studies for Furrow and Girdwood Creeks in 2006. This project is a legacy Map Mod project which is currently on hold due to the change in FEMA's levee policy.
  The new levee analysis and mapping approach FEMA has developed is currently in the 45-day "Public Review and Comment" Period which started on December 15, 2011.
- Under the Risk MAP Program, FEMA commenced a Physical Map Revision/LiDAR Acquisition project comprised of a mix of detailed studies and redelineations, including a detailed study of Eagle River and re-delineation of Girdwood flooding sources and of Little Campbell Creek. This project has been suspended due to numerous concerns the Municipality had with technical and procedural aspects of the project, including the vertical datum and the scope of the project study. FEMA plans to continue the project once these concerns are addressed and resolved.

City of Aniak

The City of Aniak was selected for a Risk MAP study in 2014. FEMA and the State of Alaska will begin the Discovery process in late 2015.

City of Bethel

The City of Bethel was selected for a Risk MAP study in 2014. FEMA and the State of Alaska will begin the Discovery process in late 2015.

Figure 9: Flooding in the Village of Aniak

City of Cordova

FEMA and the State of Alaska are conducting a coastal Risk MAP Study in the City of Cordova that began in 2011.

Study Scope

The scope of work of the City of Cordova Risk MAP Study includes (see also the map on page 40)

- The mapping of approximately 9.7 miles of shoreline utilizing the new storm surge modeling (coastal hydrology) and overland wave height analysis (coastal hydraulics), as well as floodplain boundaries for 1-percent and 0.2-percent-annual-chance (100- and 500-year) flood events. Updated areas include approximately 4.5 miles of Eyak Lake, 1 mile of Eyak River using detailed study analysis, 1.2 miles of Ibek River using approximate study analysis, and 1.0 miles of Shaded Zone X on Fleming Creek, Creek No. 1, and Creek No. 2 using approximate study analysis.
- Preparation of a regulatory Flood Insurance Study (FIS) Report document to the Community. A FIS is a book that contains information regarding flooding in a community and is developed in conjunction with the FIRM. The FIS, also known as a flood elevation study, frequently contains a narrative of the flood history of a community and discusses the engineering methods used to develop the FIRM. The study also contains flood profiles for studied flooding sources and can be used to determine Base Flood Elevations for some areas.
- Preparation of a regulatory Flood Insurance Rate Map (FIRM) map for all panels within the Community which identifies the Community's flood zones, base flood elevations, and floodplain boundaries. This map is used to determine where the purchase of flood insurance is required for properties with federally-backed mortgages. The preliminary FIS and DFIRM’s were released on August 25, 2014.
- All of the above datasets will be in the in the North American Vertical Datum of 1988.
- The State and FEMA will provide guidance, feedback, coordination and technical support throughout the Risk MAP Project Life Cycle.

Cordova Project Status

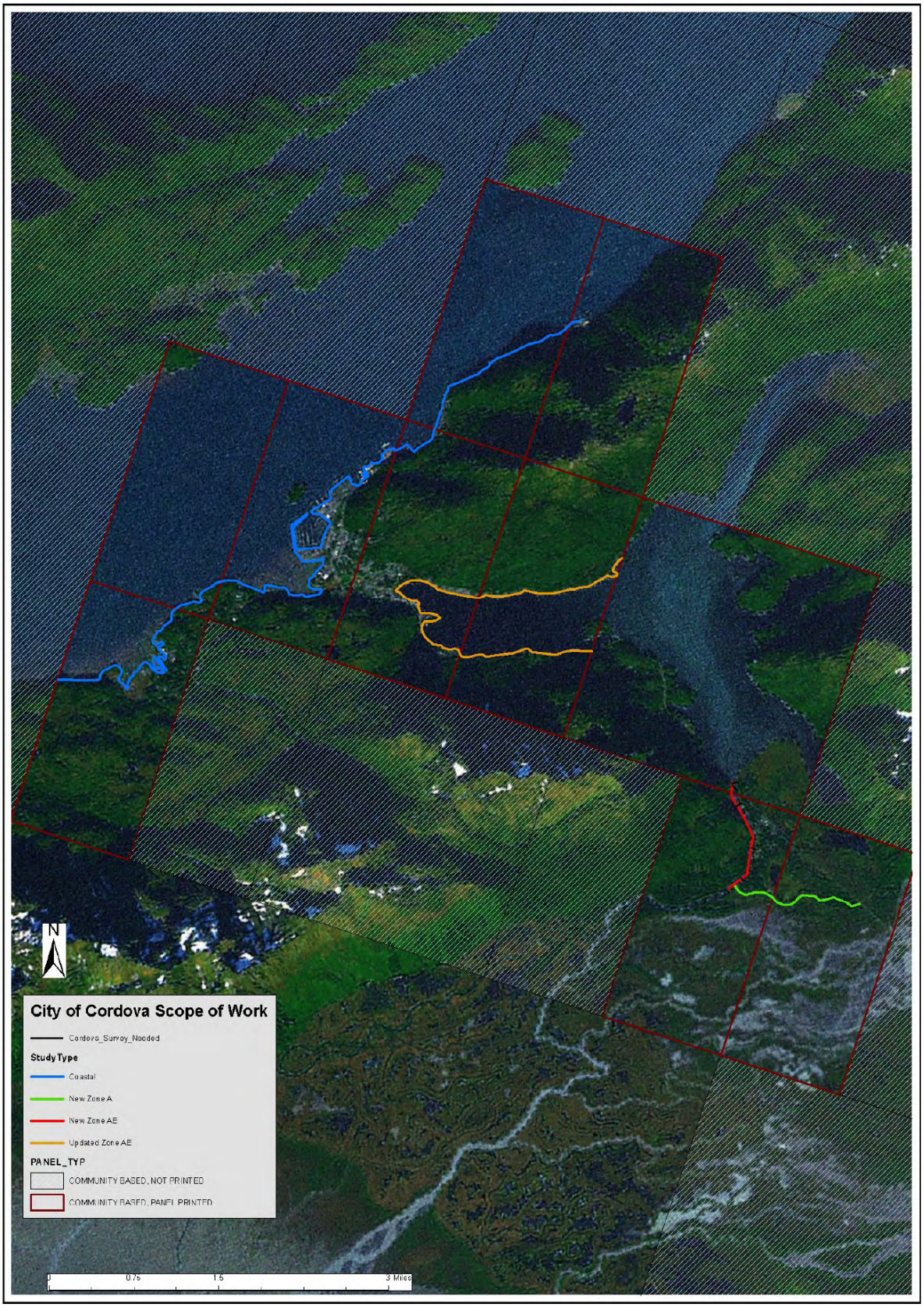
FEMA, State, and Local stakeholders participated in a Risk MAP Discovery Meeting held March 4, 2011 where community concerns were identified. These concerns were captured in the Risk MAP Discovery Report and delivered to the community. The table below illustrates project status and includes major milestones with dates:

Table 12: Cordova Project Status

Activity	Actual or Projected End Date
Cordova Discovery Interview	February 11, 2011
Cordova Discovery Meeting	March 4, 2011
Base Map Acquisition	Spring 2011
Discovery Report	May 2011
Perform Field Survey/Develop Topographic Data	Summer 2013
Perform Coastal Analysis/Hydraulic Analysis	January 2014
Perform Floodplain Mapping/Develop DFIRM Database	Spring 2014
Draft Work Maps Issued	March 14, 2014
Flood Risk Review Meeting	June 25, 2012
Preliminary DFIRM/FIS Released	August 25, 2014
Consultation Coordination Officers (CCO) Meeting	September 23, 2014
Public Meeting/Workshop	September 23, 2014
Revised Preliminary DFIRM/FIS Release	October 31, 2014
90-Day Appeal Period Start Date	January 2, 2015
90-Day Appeal Period End Date	April 4, 2015
Letter of Final Determination Issued	June 16, 2015
Draft Multi-Hazard Risk Report	Summer/Fall 2015*
Flood Risk Datasets (CSLF, depth grids)	Winter 2015/2016*
Risk MAP Resilience Webinar	Winter 2015/2016*
DFIRM/FIS Effective Date	December 16, 2015
Delivery of Final Risk report and Risk Assessment Database	Winter 2015/2016*

**All projected dates are subject to revision as the project progresses*

Figure 10: Map of Cordova Project Scope



Fairbanks North Star Borough

In 2014, FEMA completed a legacy Map Modernization study begun in 2006 to re-study some of the map panels in the Fairbanks North Star Borough FIRM.

The scope of the project included detailed study of the Chena River from its mouth to Moose Creek Dam, Noyes Slough, and the Little Chena River from its confluence with Chena River to 10,800 feet upstream of Chena Hot Springs Road. This study also includes the flood-prone areas along the Tanana River and the Chena Slough that are unchanged from the August 1982 edition of the Flood Insurance Rate Map. Earlier studies on the Chena and Little Chena rivers were approximations of flood potentials derived from aerial photography during actual flooding events. This study was an integral part of a U.S. Army Corps of Engineers Environmental Assessment on the Chena River Lakes Flood Control Project which concluded that the congressionally authorized maximum flow release in downtown Fairbanks of 12,000 cubic feet per second (cfs) should not be changed. Approximate analyses were used to study those areas having a low development potential or minimal flood hazards.

The revised flood hazard determinations and FIRM map panels became effective on March 17, 2014,

City of Emmonak

The City of Emmonak was selected for a Risk MAP study in 2014. FEMA and the State of Alaska began the Discovery process in the summer of 2015.

Figure 11: Widespread Flooding in Emmonak, May 2005

City of Homer

In Early February 2011, FEMA initiated a Coastal Physical Map Revision study to update the DFIRM for the Homer Spit. This project included 8 miles of revised coastal hazard analysis that included collection of storm surge data (coastal hydrology) and the analysis of overland wave height (coastal hydraulics), in addition to computing wave run-up. The new Flood Insurance Rate Maps (FIRMs) became effective November 6, 2013.

The Homer coastal area is also part of Coastal Physical Map Revision of the Kenai Peninsula Borough (see study area identified on the map on page 48).

Coastal Study Scope

Specific to the City of Homer, the scope of work of the Kenai Peninsula Borough Risk MAP Study includes:

- A detailed coastal flood hazard analysis including the collection of storm surge (coastal hydrology) and overland wave height analysis (coastal hydraulics) near Beluga Lake and Beluga Slough
- Preparation of a regulatory Flood Insurance Study (FIS) Report document to the Community. A FIS is a book that contains information regarding flooding in a community and is developed in conjunction with the FIRM. The FIS, also known as a flood elevation study, frequently contains a narrative of the flood history of a community and discusses the engineering methods used to develop the FIRM. The study also contains flood profiles for studied flooding sources and can be used to determine Base Flood Elevations for some areas.
- Preparation of a regulatory Flood Insurance Rate Map (FIRM) map for all panels within the Community which identifies the Community's flood zones, base flood elevations, and floodplain boundaries. This map is used to determine where the purchase of flood insurance is required for properties with federally-backed mortgages. The preliminary FIS and DFIRM’s are scheduled to be released in Winter/Spring 2016.
- All of the above datasets will be in the in the North American Vertical Datum of 1988.
- The State and FEMA will provide guidance, feedback, coordination and technical support throughout the Risk MAP Project Life Cycle.

Status of Homer Project

FEMA, State, and Local stakeholders participated in a Risk MAP Discovery/Scoping Meeting held March 2, 2011 where community concerns were identified. These concerns were captured in the Risk MAP Discovery Report and delivered to the communities in the Borough. After the Discovery/Scoping Meeting, community concerns were researched and analyzed, in order to develop a scope of work that includes multi -hazard risk assessment products and updates to the communities' regulatory flood maps based on community-identified resilience needs. The following table illustrates project status and includes major milestones with dates:

Table 13: Homer Project Status

Activity	Actual or Projected End Date
Homer Discovery Interview	January 25, 2011
Homer Discovery Meeting	March 2, 2011
Discovery Report	May 2011
Flood Study Kick-Off Meeting	July 23-26, 2012
Draft Maps Released/ Flood Risk Review Meeting	August 27-28, 2013
Preliminary DFIRM/FIS Release	June 13, 2014
Consultation Coordination Officers (CCO) Meeting	September 9-11, 2014
Public Meeting/Workshop	September 9-11, 2014
90-day Appeal Period Start Date	1st: January 28, 2015; 2nd: August 12, 2015
90-day Appeal Period End Date	1st: April 28, 2015; 2nd: November 10, 2015
Issue Letter of Final Determination	Early April 2016*
Draft Multi-Hazard Risk Report	Early April 2016*
Risk MAP Resilience Workshop	Summer 2016*
Delivery of Final Risk Report and Risk Assessment Database	Summer 2016*
DFIRM/FIS Become Effective	Early September 2016*

**All projected dates are subject to revision as the project progresses*

City and Borough of Juneau

In 2013, a legacy Map Modernization study was completed to develop DFIRMs for coastal and riverine areas within the City and Borough of Juneau (CBJ). These maps became effective August 19, 2013.

FEMA and the State of Alaska are currently conducting a Risk MAP Study in the CBJ that began in late 2013.

Project Scope

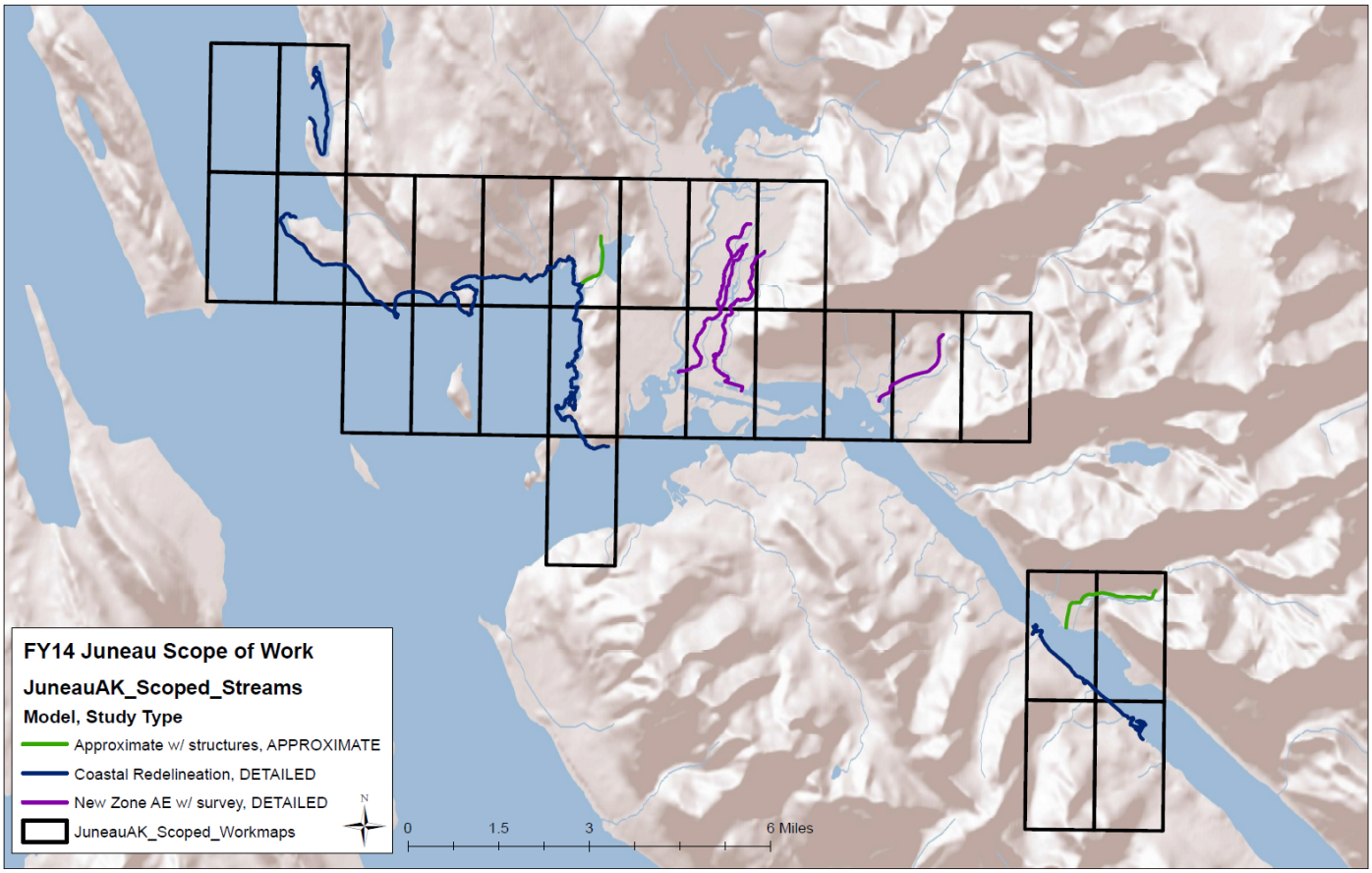
The table below outlines the engineering work scoped for the City and Borough of Juneau.

Table 14: Juneau Project Scope

Stream Name	Riverine or Coastal	Modeling Type (ZONE)	Stream Length
Duck Creek	Riverine	Detailed (Zone AE)	3 miles
Lemon Creek	Riverine	Detailed (Zone AE)	2 miles
Jordan Creek	Riverine	Detailed (Zone AE)	3 miles
Unnamed Tributary to Duck Creek	Riverine	Detailed (Zone AE)	0.25 miles
East Fork Duck Creek	Riverine	Detailed (Zone AE)	1 mile
Gold Creek	Riverine	Approximate with structures (Zone A)	2 miles
Auke Lake	Riverine	Approximate with structures (Zone A)	1 mile
Auke Bay	Coastal	Detailed Redelineation (Zone VE)	15 miles
Douglas Harbor	Coastal	Detailed Redelineation (Zone VE)	4 miles
Tee Harbor	Coastal	New Coastal Study (Zone V or VE)	3 miles

The map on the following page illustrates the project scope locations.

Figure 12: Map of City and Borough of Juneau Risk MAP Study Scope



Status of City and Borough of Juneau Project

FEMA, State, and Local stakeholders participated in a Risk MAP Discovery Meeting held September 26, 2013 where community concerns were identified. Additional areas of concern were sent via email on February 20, 2014. These concerns were captured in the Risk MAP Discovery Report and delivered to the communities in the watershed. After Discovery, community concerns were researched and analyzed, in order to develop a scope of work that includes multi-hazard risk assessment products and updates to the communities' regulatory flood maps based on community-identified resilience needs. Community comments on the Discovery report will be reviewed and addressed, as necessary.

Table 15: Juneau Project Status

Activity	Actual or Projected End Date
City and Borough of Juneau Discovery Interview	January 26-28, 2011
City and Borough of Juneau Discovery Meeting	September 26, 2013
Flood Study Kick-Off Call	Early Spring 2016*
Draft Map Release	Mid-Spring 2016*
Flood Risk Review (FRR) Meeting	To Be Determined
Preliminary DFIRM/FIS Release	To Be Determined
Consultation Coordination Officers (CCO) Meeting	To Be Determined
Public Meeting/Workshop	To Be Determined
Appeal Period Starts	To Be Determined
Appeal Period Ends	To Be Determined
Letter of Final Determination	To Be Determined
Draft Multi-Hazard Risk Report	To Be Determined
Risk MAP Resilience Workshop	To Be Determined
Delivery of Final Risk Report and Risk Assessment Database	To Be Determined
Maps and FIS become Effective	To Be Determined

**All projected dates are subject to revision as the project progresses*

Kenai Peninsula Borough

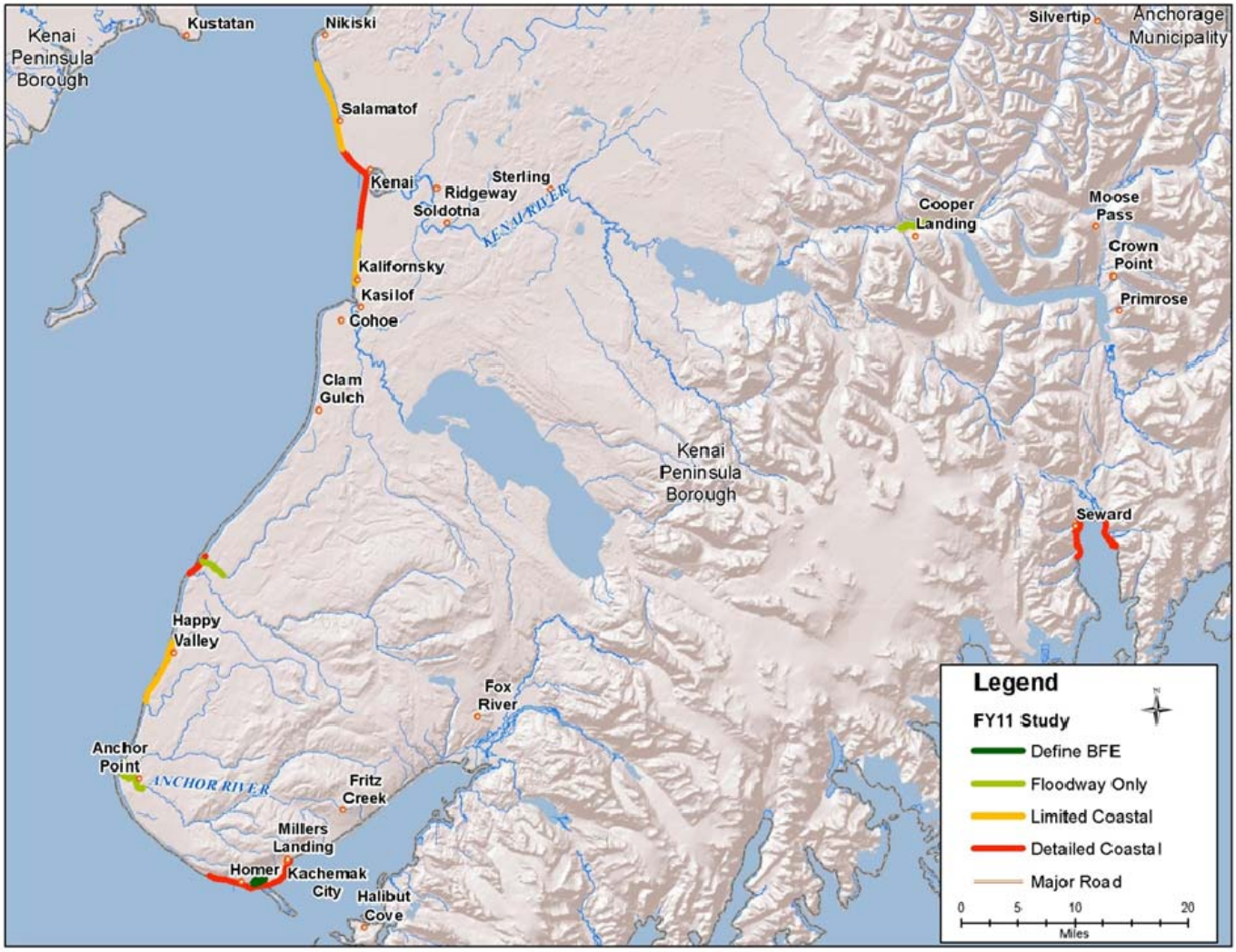
FEMA and the State of Alaska are conducting a coastal Risk MAP Study in the Kenai Peninsula Borough that began in 2011.

Scope of Work

The scope of work of the Kenai Peninsula Borough Risk MAP Study includes (see also the map on page 45):

- 28 miles of detailed coastal studies, as well 15 miles of riverine studies in the following locations:
    - ◊ Cooper Creek – 8 miles of detailed study
    - ◊ Ninilchik – 2 miles of detailed study
    - ◊ Anchor Point – 5 miles of detailed study
- Preparation of a regulatory Flood Insurance Study (FIS) Report document to the Community. A FIS is a book that contains information regarding flooding in a community and is developed in conjunction with the FIRM. The FIS, also known as a flood elevation study, frequently contains a narrative of the flood history of a community and discusses the engineering methods used to develop the FIRM. The study also contains flood profiles for studied flooding sources and can be used to determine Base Flood Elevations for some areas.
- Preparation of a regulatory Flood Insurance Rate Map (FIRM) map for all panels within the Community which identifies the Community's flood zones, base flood elevations, and floodplain boundaries. This map is used to determine where the purchase of flood insurance is required for properties with federally-backed mortgages.
- LiDAR data was collected in 2011 and delivered to the community.
- All of the above datasets will be in the North American Vertical Datum of 1988.
- The State and FEMA will provide guidance, feedback, coordination and technical support throughout the Risk MAP Project Life Cycle.

Figure 13: Map of Kenai Peninsula Borough Coastal Project Scope



Status of Kenai Peninsula Borough Project

FEMA, State, and Local stakeholders participated in a Risk MAP Discovery/Scoping Meeting held March 2, 2011 where community concerns were identified. These concerns were captured in the Risk MAP Discovery Report and delivered to the communities in the Borough. After the Discovery/Scoping Meeting, community concerns were researched and analyzed, in order to develop a scope of work that includes multi -hazard risk assessment products and updates to the communities' regulatory flood maps based on community-identified resilience needs. The following table illustrates project status and includes major milestones with dates:

Table 16: Kenai Peninsula Borough Project Status

Activity	Actual or Projected End Date
Kenai Peninsula Borough Discovery Interview	January 26-28, 2011
Kenai Peninsula Borough Discovery Meeting	March 2, 2011
Discovery Report	May 2011
Flood Study Kick-Off Meeting	July 23-26, 2012
Draft Maps Released/ Flood Risk Review Meeting	August 27-28, 2013
Preliminary DFIRM/FIS Release	June 13, 2014
Consultation Coordination Officers (CCO) Meeting	September 9-11, 2014
Public Meeting/Workshop	September 9-11, 2014
90-day Appeal Period Start Date	1st: January 28, 2015; 2nd: August 12, 2015
90-day Appeal Period End Date	1st: April 28, 2015; 2nd: November 10, 2015
Issue Letter of Final Determination	Early April 2016*
Draft Multi-Hazard Risk Report	Early April 2016*
Risk MAP Resilience Workshop	Summer 2016*
Delivery of Final Risk Report and Risk Assessment Database	Summer 2016*
DFIRM/FIS Become Effective	Early September 2016*

**All projected dates are subject to revision as the project progresses*

Ketchikan Gateway Borough

FEMA and the State of Alaska are conducting a coastal Risk MAP Study in the Ketchikan Gateway Borough that began in 2013.

Scope of Work

The scope of work of the Ketchikan Gateway Borough Risk MAP Study includes (see also the map below):

- A detailed coastal flood hazard analysis including the collection of storm surge (coastal hydrology) and overland wave height analysis (coastal hydraulics), as well as floodplain boundaries for 1-percent and 0.2-percent-annual-chance (100- and 500-year) flood events. Updated detailed modeling will be completed for 0.99 miles on Hoadley Creek, 1.2 miles of Ketchikan Creek, and 1 mile on Schoenbar Creek. Redelineation using new LiDAR will be completed for 0.08 miles of Carlanna Creek. The draft maps will be completed in Fall 2015.
- Preparation of a regulatory Flood Insurance Study (FIS) Report document to the Community. A FIS is a book that contains information regarding flooding in a community and is developed in conjunction with the FIRM. The FIS, also known as a flood elevation study, frequently contains a narrative of the flood history of a community and discusses the engineering methods used to develop the FIRM. The study also contains flood profiles for studied flooding sources and can be used to determine Base Flood Elevations for some areas.
- Preparation of a regulatory Flood Insurance Rate Map (FIRM) map for all panels within the Community which identifies the Community's flood zones, base flood elevations, and floodplain boundaries. This map is used to determine where the purchase of flood insurance is required for properties with federally-backed mortgages. The preliminary FIS and DFIRM’s are scheduled to be released in Winter/Spring 2016.
- Collection of LiDAR data in Summer of 2014. This data will be delivered to the community in the Fall 2014.
- All of the above datasets will be in the in the North American Vertical Datum of 1988.
- The State and FEMA will provide guidance, feedback, coordination and technical support throughout the Risk MAP Project Life Cycle.

Figure 14: Map of Ketchikan Gateway Borough Coastal Study Scope

Status of Ketchikan Gateway Borough Project

The State of Alaska identified Ketchikan Gateway Borough as a priority for FEMA's Risk MAP program. The State determines its priorities based on population at risk to hazards, recent events, and community interest. FEMA, State, and Local stakeholders participated in a Risk MAP Discovery Meeting held August 7, 2013 where community concerns were identified. These concerns were captured in the Risk MAP Discovery Report and delivered to the communities in the watershed. After the Discovery Meeting, community concerns were researched and analyzed, in order to develop a scope of work that includes multi-hazard risk assessment products and updates to the communities' regulatory flood maps based on community-identified resilience needs. The following table illustrates project status and includes major milestones with dates:

Table 17: Ketchikan Project Status

Activity	Actual or Projected End Date
Ketchikan Gateway Borough Discovery Interview	June 17, 2013
Ketchikan Gateway Borough Discovery Meeting	August 7, 2013
Base Map Acquisition	February 2, 2014
Discovery Report	Summer 2014
Perform Field Survey	August 31, 2014
Develop Topographic Data/Hydrologic Analysis	Winter 2014
Coastal Analysis/Hydraulic Analysis/Floodplain Mapping	Summer 2015
Draft Work Maps	January 2016*
Draft Multi-Hazard Risk Report	Spring 2016*
Preliminary DFIRM/FIS Release	Spring 2017*
Consultation Coordination Officers (CCO) Meeting	Spring 2017*
Public Meeting/Workshop	Summer 2017*
90-Day Appeal Period Starts	Fall 2017*
90-Day Appeal Period Ends	Winter 2017/2018*
Letter of Final Determination	Spring 2018*
Risk MAP Resilience Workshop	Summer 2018*
Delivery of Final Risk Report and Risk Assessment Database	Summer 2018*
Maps and FIS become Effective	Fall 2018*

**All projected dates are subject to revision as the project progresses*

City of Kotzebue

A Risk MAP Discovery meeting was held February 23, 2011 in order to gain a clearer understanding of the flood hazard mapping, mitigation planning, and communication needs of the City of Kotzebue. The City's desired study areas are listed below.

Table 18: Desired Risk MAP Study Areas for the City of Kotzebue

Priority	Study Area	Study Length	Location Description	Study Type
1	Kotzebue Sound	2.64	Shoreline study within city limits	Coastal Detailed
2	Kotzebue Lagoon	6.76	Along the Shoreline of the Kotzebue lagoon	Detailed
3	Swan Lake	0.59	Shoreline study within city limits	Detailed
4	Ponding Areas	<1	Low areas within the city limits subject to flooding from ice thaw	Approximate

After reviewing the mapping needs identified during Discovery and current funding availability, FEMA informed the City that due to federal funding constraints, a new flood study would not be initiated this year; however the area will remain a high priority for a new study when funds become available.

Products that would be provided to Kotzebue through its Risk MAP project include:

- Available topographic data as well as new data in the future, when it becomes available
- Updated non regulatory digital flood hazard data
- Areas of Mitigation Areas of Interest findings and recommendations based on best available data
- Non-regulatory Risk MAP database containing digital project data
- Non-regulatory Risk MAP map and report depicting risk assessment results

City of Kwethluk

The City of Kwethluk was selected for a Risk MAP study in 2014. FEMA and the State of Alaska will begin the Discovery process in late 2015.

Matanuska-Susitna Borough

FEMA and the State of Alaska are conducting a coastal Risk MAP Study in the Ketchikan Gateway Borough that began in 2013.

Scope of Work

The scope of work of the Matanuska-Susitna Borough Risk MAP Study includes (see also the map below):

Detailed hydrology and hydraulic modeling to include 71.9 miles of riverine study, perform approximate riverine analysis for 316.6 miles, and delineate 15.4 miles of existing areas. Floodplain boundaries will be updated for the 1-percent and 0.2-percent-annual-chance (100- and 500-year) flood events. The rivers to be updated include:

- Updated detailed modeling (Zone AE) will be completed for:
    - ◊ Little Susitna River (including Split Flows 1-3) = 39.2 miles
    - ◊ Willow Creek = 13.3 miles
    - ◊ Willow Creek Tributary = 7.1 miles

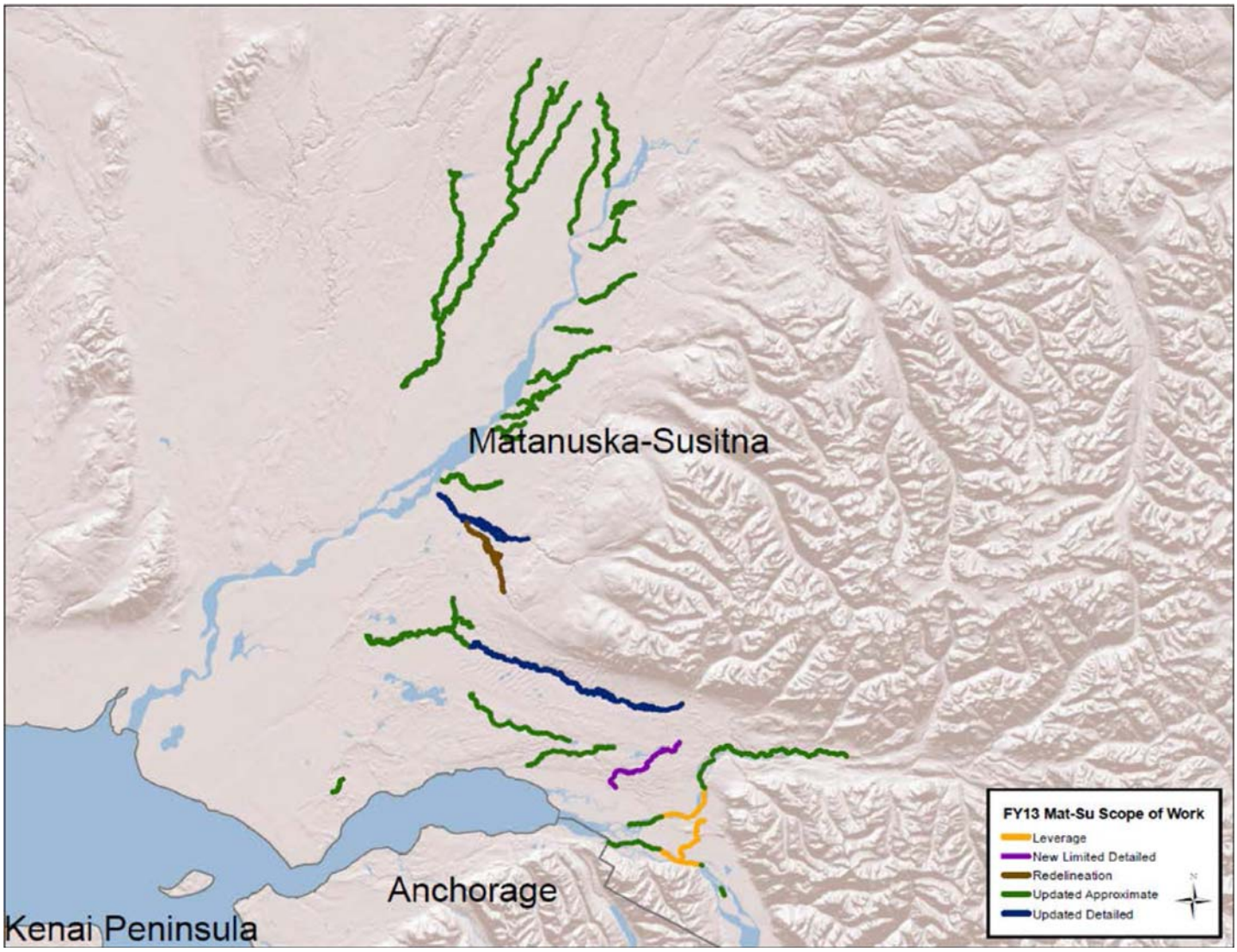
- Limited detail modeling (Zone A with structures) will be completed for:
    - ◊ Wasilla Creek = 10.7 miles

- Updated Approximate Studies (Zone A) will be completed for:
    - ◊ Upper Matanuska River = 14 miles
    - ◊ Point MacKenzie = 2 miles – roughly from Walsop Road to 2 miles downstream of Walsop Road.
    - ◊ Various Zone A = 289.9 miles

- Redelineation of Effective Detailed Studies (Zone AE) will be completed for:
    - ◊ Deception Creek and Tributaries 1-3 = 15.4 miles

- US Army Corps of Engineers (USACE) Studies (Leverage - Zone AE) will also be incorporated to include:
    - ◊ Matanuska River = 3.9 miles
    - ◊ Knik River = 2.7 miles
    - ◊ Bodenburg Creek = 5.7 miles

Figure 15: Map of Matanuska-Susitna Borough Project Scope



Status of Matanuska-Susitna Borough Risk MAP Project

FEMA, State, and Local stakeholders participated in a Risk MAP Discovery/Scoping Meeting held April 23, 2013 where community concerns were identified. These concerns were captured in the Risk MAP Discovery Report and delivered to the communities in the watershed. After the Discovery/Scoping Meeting, community concerns were researched and analyzed, in order to develop a scope of work that includes multi-hazard risk assessment products and updates to the communities' regulatory flood maps based on community-identified resilience needs. The following table illustrates project status and includes major milestones with dates:

Table 19: Matanuska-Susitna Borough Project Status

Activity	Projected Completion Date*
Matanuska-Susitna Discovery Interview	March 11, 2013
Matanuska-Susitna Discovery Meeting	April 23, 2013
Flood Study Kick-Off Meeting	Late Summer/Early Fall 2015
Flood Risk Review Meeting (FRR)/Draft Maps	To Be Determined
Preliminary DFIRM/FIS Release	To Be Determined
Consultation Coordination Officers (CCO) Meeting	To Be Determined
Public Meeting/Workshop	To Be Determined
Appeal Period Starts	To Be Determined
Appeal Period Ends	To Be Determined
Letter of Final Determination	To Be Determined
Draft Multi-Hazard Risk Report	To Be Determined
Risk MAP Resilience Workshop	To Be Determined
Delivery of Final Risk Report and Risk Assessment Database	To Be Determined
Maps and FIS become Effective	To Be Determined

**All projected dates are subject to revision as the project progresses*

City and Borough of Sitka

FEMA and the State of Alaska are conducting a coastal Risk MAP Study in the City and Borough of Sitka that began in 2013.

Study Scope

The scope of work of the City and Borough of Sitka Risk MAP Study includes (see also the map on page 58):

- A detailed coastal flood hazard analysis including the collection of storm surge (coastal hydrology) and overland wave height analysis (coastal hydraulics), as well as floodplain boundaries for 1-percent and 0.2-percent-annual-chance (100- and 500-year) flood events. 0.67 miles of Swan Lake will be updated using approximate modeling and 1 mile of Indian River will be redelineated using new LiDAR. The draft maps will be completed in Spring/Summer 2015.
- Preparation of a regulatory Flood Insurance Study (FIS) Report document to the Community. A FIS is a book that contains information regarding flooding in a community and is developed in conjunction with the FIRM. The FIS, also known as a flood elevation study, frequently contains a narrative of the flood history of a community and discusses the engineering methods used to develop the FIRM. The study also contains flood profiles for studied flooding sources and can be used to determine Base Flood Elevations for some areas.
- Preparation of a regulatory Flood Insurance Rate Map (FIRM) map for all panels within the Community which identifies the Community's flood zones, base flood elevations, and floodplain boundaries. This map is used to determine where the purchase of flood insurance is required for properties with federally-backed mortgages. The preliminary FIS and DFIRM’s are scheduled to be released in Winter/Spring 2016.
- Collect LiDAR in Spring/Summer of 2014. This data will be delivered to the community by Sept. 30, 2014.
- All of the above datasets will be in the in the North American Vertical Datum of 1988.
- The State and FEMA will provide guidance, feedback, coordination and technical support throughout the Risk MAP Project Life Cycle.

Figure 16: Map of Sitka Study Scope

Sitka Project Status

FEMA, State, and Local stakeholders participated in a Risk MAP Discovery Meeting held August 5, 2013 where community concerns were identified. These concerns were captured in the Risk MAP Discovery Report and delivered to the communities in the City and Borough of Sitka. After the Discovery Meeting, community concerns were researched and analyzed, in order to develop a scope of work that includes multi -hazard risk assessment products based on community-identified resilience needs. The following table illustrates project status and includes major milestones with dates:

Table 20: Sitka Project Status

Activity	Actual or Projected End Date
Discovery Interview	June 5, 2013
Discovery Meeting	August 5, 2013
Flood Risk Review (FRR) Meeting/Draft Maps Released	August/September 2015*
Preliminary DFIRM/FIS Release	To Be Determined
Consultation Coordination Officers (CCO) Meeting	To Be Determined
Public Meeting/Workshop	To Be Determined
Appeal Period Start	To Be Determined
Appeal Period Ends	To Be Determined
Letter of Final Determination	To Be Determined
Draft Multi-Hazard Risk Report	To Be Determined
Risk MAP Resilience Workshop	To Be Determined
Delivery of Final Report and Risk Assessment Database	To Be Determined
Maps and FIS become Effective	To Be Determined

**All projected dates are subject to revision as the project progresses*

City of Seward

In 2010, FEMA initiated a Risk MAP project to develop a Physical Map Revision of the Japanese Creek Alluvial Fan. The project scope of work includes 2.5 miles of detailed study near the confluence with Lowell Creek. Because the study area includes a levee that hasn't been accredited for National Flood Insurance Program (NFIP) requirements, the project has been placed on hold until FEMA finalizes its guidance for mapping non-accredited levees.

The Seward coastal area is also part of Coastal Physical Map Revision of the Kenai Peninsula Borough (see study area identified on the map on page 48).

Coastal Study Scope

Specific to the City of Seward, the scope of work of the Kenai Peninsula Borough Risk MAP Study includes:

- Ten miles of detailed coastal flood hazard analysis including the collection of storm surge (coastal hydrology) and overland wave height analysis (coastal hydraulics) of Resurrection Bay.
- Preparation of a regulatory Flood Insurance Study (FIS) Report document to the Community. A FIS is a book that contains information regarding flooding in a community and is developed in conjunction with the FIRM. The FIS, also known as a flood elevation study, frequently contains a narrative of the flood history of a community and discusses the engineering methods used to develop the FIRM. The study also contains flood profiles for studied flooding sources and can be used to determine Base Flood Elevations for some areas.
- Preparation of a regulatory Flood Insurance Rate Map (FIRM) map for all panels within the Community which identifies the Community's flood zones, base flood elevations, and floodplain boundaries. This map is used to determine where the purchase of flood insurance is required for properties with federally-backed mortgages. The preliminary FIS and DFIRM’s are scheduled to be released in Winter/Spring 2016.
- All of the above datasets will be in the in the North American Vertical Datum of 1988.
- The State and FEMA will provide guidance, feedback, coordination and technical support throughout the Risk MAP Project Life Cycle.

Status of Seward Project

FEMA, State, and Local stakeholders participated in a Risk MAP Discovery/Scoping Meeting held March 2, 2011 where community concerns were identified. These concerns were captured in the Risk MAP Discovery Report and delivered to the communities in the Borough. After the Discovery/Scoping Meeting, community concerns were researched and analyzed, in order to develop a scope of work that includes multi-hazard risk assessment products and updates to the communities' regulatory flood maps based on community-identified resilience needs. The following table illustrates project status and includes major milestones with dates:

Table 21: Seward Project Status

Activity	Actual or Projected End Date
Seward Discovery Interview	February 2, 2011
Seward Discovery Meeting	March 2, 2011
Discovery Report	May 2011
Flood Study Kick-Off Meeting	July 23-26, 2012
Draft Maps Released/ Flood Risk Review Meeting	August 27-28, 2013
Preliminary DFIRM/FIS Release	June 13, 2014
Consultation Coordination Officers (CCO) Meeting	September 9-11, 2014
Public Meeting/Workshop	September 9-11, 2014
90-day Appeal Period Start Date	1st: January 28, 2015; 2nd: August 12, 2015
90-day Appeal Period End Date	1st: April 28, 2015; 2nd: November 10, 2015
Issue Letter of Final Determination	Early April 2016*
Draft Multi-Hazard Risk Report	Early April 2016*
Risk MAP Resilience Workshop	Summer 2016*
Delivery of Final Risk Report and Risk Assessment Database	Summer 2016*
DFIRM/FIS Become Effective	Early September 2016*

**All projected dates are subject to revision as the project progresses*

City of Valdez

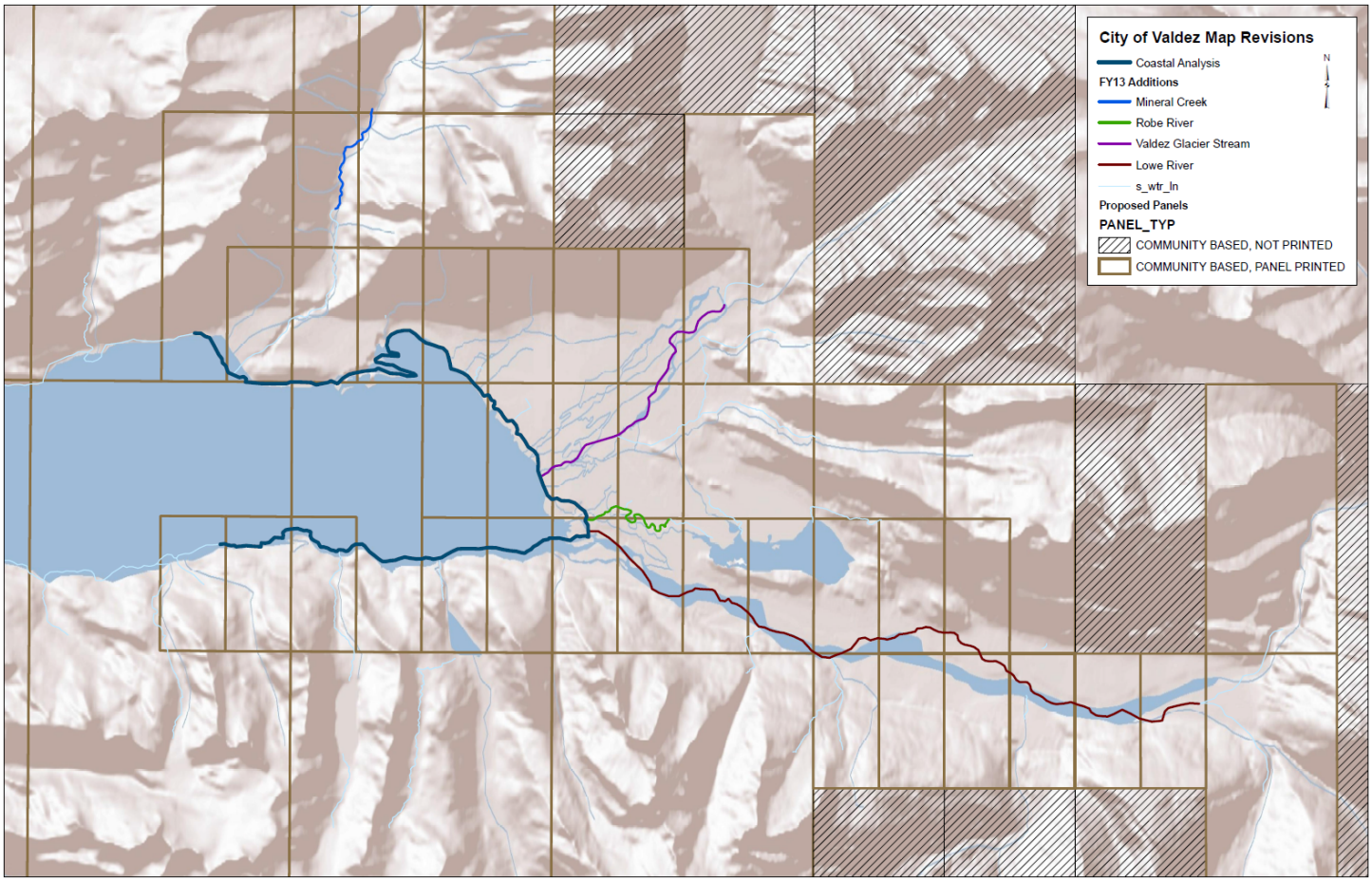
FEMA and the State of Alaska are conducting a coastal Risk MAP Study in the City of Valdez that began in 2013.

Scope of Work

The scope of work of the Valdez Risk MAP Study includes (see also the map below):

- A detailed coastal flood hazard analysis including the collection of storm surge (coastal hydrology) and overland wave height analysis (coastal hydraulics), as well as floodplain boundaries for 1-percent and 0.2-percent-annual-chance (100- and 500-year) flood events. A riverine analysis will also be performed to include hydrology and hydraulic modeling for 3.8 miles of detailed riverine study on Mineral Creek, 11.7 miles of detailed riverine study on Lowe River, 4.6 miles of detailed riverine study on Valdez Glacier Stream, 2.2 miles of detailed riverine study on Robe River, and 18.7 miles of approximate riverine modeling on various streams. Floodplain delineations and the Flood Insurance Study will be updated for the entire City. A draft map for the coastal analysis will be completed in spring 2014. The draft map for the riverine analysis will be completed in Fall 2014.
- Preparation of a regulatory Flood Insurance Study (FIS) Report document to the City. A FIS is a book that contains information regarding flooding in a city and is developed in conjunction with the FIRM. The FIS, also known as a flood elevation study, frequently contains a narrative of the flood history of a city and discusses the engineering methods used to develop the FIRM. The study also contains flood profiles for studied flooding sources and can be used to determine Base Flood Elevations for some areas.
- Preparation of regulatory Flood Insurance Rate Map (FIRM) map for all panels within the City which identifies the City's flood zones, base flood elevations, and floodplain boundaries. This map is used to determine where the purchase of flood insurance is required for properties with federally-backed mortgages. The preliminary FIS and DFIRM’s are scheduled to be released in winter 2014.
- Guidance, feedback, coordination and technical support throughout the Risk MAP Project Life Cycle.

Figure 17: Map of Valdez Study Scope



Valdez Project Status

The State of Alaska identified the City of Valdez as a priority for FEMA's Risk MAP program. FEMA, State, and Local stakeholders participated in a Risk MAP Discovery Meeting held June 11, 2011 where community concerns were identified. These concerns were captured in the Risk MAP Discovery Report and delivered to the City of Valdez. After the Discovery Meeting, the City of Valdez's concerns were researched and analyzed, in order to develop a scope of work that includes multi-hazard risk assessment products and updates to the communities' regulatory flood maps based on community identified resilience needs. The table below illustrates project status and includes major milestones with dates:

Table 22: Valdez Project Status

Activity	Actual or Projected End Date
Valdez Discovery Interview	February 28, 2011
Valdez Discovery Meeting	July 11, 2011
Discovery Report	Summer 2011
Coastal Analysis	Spring 2014
Draft Map Release – Coastal	April 2014
Flood Risk Review Meeting – Coastal	June 26, 2014
Riverine Analysis	Winter 2014/Spring 2015
Draft Map Release – Riverine	April 30, 2015
Flood Risk Review Meeting – Riverine	August 12, 2015
DFIRM Preliminary Date	Winter 2015/2016*
Consultation Coordination Officers (CCO) Meeting	Spring 2016*
Public Meeting/Workshop	Spring 2016*
Draft Multi-Hazard Risk Report	Late Spring 2016*
90-Day Appeal Period Start Date	Late Spring 2016*
90-Day Appeal Period End Date	Late Summer 2016*
Issue Letter of Final Determination	Winter 2016*
Risk MAP Resilience Workshop	Spring 2017*
Delivery of Final Risk Report/ Risk Assessment Database	Early Summer 2017*
DFIRM/FIS Effective Date	Early Summer 2017*

**All projected dates are subject to revision as the project progresses*

Table 23: Current FEMA Flood Mapping Studies in Alaska

NFIP Participating Community	Project Name	Map Mod	Risk MAP	Project Type	Status
Anchorage, Municipality of	Discovery - Anchorage		X	Discovery/TBD	Active
	Anchorage (Girdwood), AK	X		Physical Map Revision incorporating new studies for Furrow and Girdwood Creeks.	Levee On-hold
	REG-Anchorage PMR-FY09 (EO)		X	Physical Map Revision/LiDAR Acquisition	Suspended
City of Aniak	Discovery - Aniak		X	Discovery	TBD
City of Bethel	Discovery - Bethel		X	Discovery	TBD
City of Cordova	Coastal-AK-Cordova		X	Discovery/LiDAR Acquisition	Discovery Complete
	RM-FY11-AK-Prince William Sound-LiDAR (Also includes Valdez, see below)		X	LiDAR Acquisition	Complete
	PMR- FY13		X	Physical Map Revision	Complete
City of Emmonak	Discovery - Emmonak		X	Discovery	Active
Fairbanks North Star Borough	Fairbanks North Star Borough	X		County	Complete
City of Homer	REG-AK-Homer Spit-PMR-FY10		X	Physical Map Revision	Complete
City and Borough of Juneau	Discovery - Juneau		X	Discovery/TBD	Active
	Juneau, AK (Coastal and Mult. Riverine) DFIRM	X		County	Complete
Kenai Peninsula Borough	REG- AK - Kenai Peninsula Borough PMR- FY11 (CO)		X	Coastal Physical Map Revision	Complete
Ketchikan Gateway Borough	Discovery - Ketchikan		X	Discovery	Active
City of Kotzebue	Coastal-AK-Kotzebue		X	Discovery	Complete
City of Kwethluk	Discovery - Kwethluk		X	Discovery	TBD
Matanuska-Susitna Borough	Discovery - Mat-Su		X	Discovery	Complete
City and Borough of Sitka	Discovery - Sitka		X	Discovery	Complete
City of Seward	Seward, AK	X		Community	Complete
	REG-Seward Japanese Creek PMR-FY09 (O)		X	Physical Map Revision	On hold
City of Valdez	Coastal-AK-Valdez		X	Discovery/LiDAR Acquisition	Complete
	RM-FY11-AK-Prince William Sound-LiDAR (Also includes Cordova, see above)		X	LiDAR Acquisition	Complete
	PMR- FY13		X	Physical Map Revision	Active

Mapping Issues in Alaska

Alaska's size and diverse, or absent, political jurisdictions present unique challenges to state and federal agencies responsible for updating existing flood hazard mapping, preparing new flood maps in unmapped communities, or preparing hazard mitigation plans and policies using adequate risk data. Furthermore, flood maps, hydrology, and other risk data is significantly outdated (Miller, 2008): Over 98% of Alaska's regulatory maps used by communities participating in the NFIP are over ten years old; 67% of the regulatory maps are over 15 years old.

The hydrology for FIRMs is based largely on data from 1974 and earlier -- data that is nearly 40 years old. Flood disaster losses and state and federal costs for flood-related disaster relief continue to climb, primarily in rural Alaska where the flood maps in communities not participating in the NFIP are generally over 30 years old.

Alaska is the only state in the nation lacking digital imagery and elevation data at nationally-accepted standards. One reason for this is the state's remote location and size, which, due to the extreme cost and accessibility, has precluded the acquisition of this data. Another challenge has to do with the horizontal and vertical reference datums established by the National Spatial Reference System (NSRS). In particular, issues have arisen with the application in Alaska of the NSRS's vertical reference datum, the North American Vertical Datum of 1988 (NAVD 88).[3]

The National Geodetic Survey (NGS) of the National Oceanic and Atmospheric Administration (NOAA) has cited several issues with the use of NAVD88. The NAVD 88 was established in 1991 by the minimum-constraint adjustment of geodetic leveling observations in Canada, the United States, and Mexico. It held fixed the height of the primary tidal benchmark, referenced to the International Great Lakes Datum of 1985 local mean sea level height value, at Rimouski, Quebec, Canada.

Many of the passive or fixed controls (or benchmarks) realized by NAVD88 have not been releveled for many years. Because of Alaska's seismic activity and glacial recession, land movement can complicate the use of NAVD88 in the state. NAVD88 does not account for local vertical velocities (such as subsidence and uplift), including post-glacial isostatic readjustment, subsurface fluid withdrawal, sediment loading, and sea level rise. These issues contribute to a level of error in NAVD, which in Alaska can be as great as 1 to 2 meters (or 3.3 to 6.5 feet).

[2] David F. Maune, Ph.D., Dewberry. Digital Elevation Model (DEM) Data for the Alaska Statewide Digital Mapping Initiative (SDMI). National Geospatial Advisory Committee Meeting, October 15, 2008, Shepherdstown, West Virginia.10.
[3] Maune 10.

NOAA recommends GEOID09, a refined hybrid model of the geoid in the United States and other territories which is intended for converting between the NAVD88 vertical datum and the NAD83 ellipsoid reference frame.

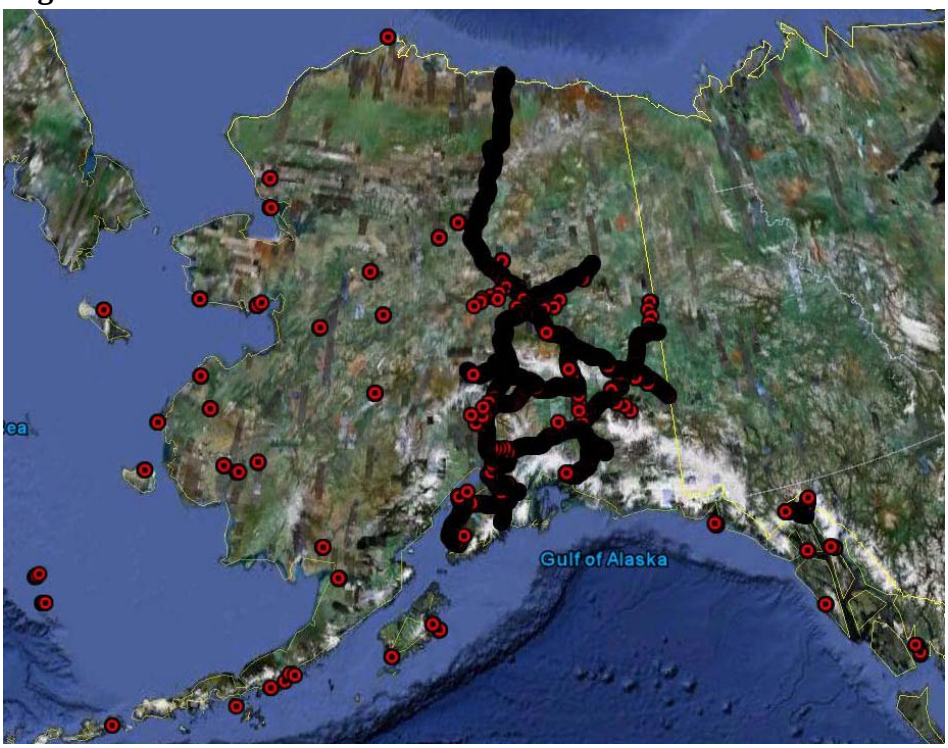
Perhaps the larger issue is the lack of density control points in Alaska's vertical reference system to adequately support sub-meter level accuracies for mapping and positioning activities. Nearly the entire western half of the state lacks NAVD benchmarks.[4]

The challenges that Alaska faces with regard to the NAVD reference datum are significant compared to the rest of the nation. For instance, Alaska, measuring 800 miles east to west (Canada border to Hooper Bay) and 800 miles north to south (Barrow to Seward), has only 3,608 NAVD88 published stations (see Figure 8, below) -- ***an average of one NAVD88 benchmark for every 177 square miles***. Compare this to the state of Wisconsin, which measures 295 miles east to west and 320 miles north to south, and has 11,090 NAVD88 published stations -- ***an average of one NAVD88 benchmark for every 8.5 square miles.***[5]

[4] Maune 10.

[5] Erik Oppegard. *Problems with the Vertical Reference Frame in Alaska*. Alaska Surveying and Mapping Conference 2010, Anchorage, Alaska.

Figure 18: NAVD88 Published Stations in Alaska



Source: Erik Oppengard, JOA Surveys

Table 24: NAVD88 Benchmarks in NFIP-Participating Communities

Community Name	FIRM	Notes
City of Aniak	0	
City of Bethel	0	
City of Cordova	0	None of the benchmarks in the Valdez-Cordova Census Area are located in Cordova
City of Delta Junction	0	
City of Dillingham	0	
City of Emmonak	0	
City of Fort Yukon	0	
City of Galena	0	
City of Homer	2	TT0152, TT0155
City of Hoonah	0	
City of Kotzebue	0	
City of Koyukuk	0	
City of Kwethluk	0	
City of McGrath	0	
City of Nenana	0	
City of Nome	0	The 2 benchmarks in the Nome Census Area are located in Savoonga
City of Petersburg	6	AA1888, AI4917 , AI4918, AI4919, AA1890, AA1889
City of Seward	0	
City of Shishmaref	0	
City of Togiak	0	
City of Valdez	0	None of the benchmarks in the Valdez-Cordova Census Area are located in Valdez
Municipality of Anchorage	15	
Fairbanks North Star Borough	9	
Haines Borough	3	
City and Borough of Juneau	0	
Kenai Peninsula Borough	36	*Does not include benchmarks in Homer
Ketchikan Gateway Borough	0	
Lake and Peninsula Borough	0	
Matanuska-Susitna Borough	71	
Northwest Arctic Borough	0	
City and Borough of Sitka	0	
Municipality of Skagway	1	
TOTAL	**143**	

Benchmark information from National Geodetic Survey Benchmark Datasheets by County at www.ngs.noaa.gov/cgi-bin/ds_county.prl

DCRA: AN EFFECTIVE COOPERATING TECHNICAL PARTNER

Alaska's constitution calls for an executive branch agency to advise and assist local governments (Article X, Section 14). The duty to serve as the constitutional local government agency is delegated to Commerce pursuant to AS 44.33.020(a)(4).6. Within Commerce, DCRA performs the local government agency's functions.

Consistent with its mission, DCRA has been the designated State Coordinating Agency for the NFIP for more than thirty years. DCRA was directed to serve in this capacity by Alaska Administrative Order No. 46, which took effect on January 24, 1978. Currently, Alaska Administrative Order No. 175 designates DCRA as the Governor’s designated State Coordinating Agency for the NFIP. Administrative Order No. 175 directs DCRA to assist state agencies in complying with this order through the following land use measures:

- Protecting the state’s capital investments by ensuring future state-owned and state-financed construction projects are sited and constructed in a manner that reduces the potential for flood and erosion damage;
- Sighting and constructing state-owned and state-financed projects using FEMA regulations pertaining to construction standards as a guide for flood-prone, mudflow-prone, and flood-related erosion-prone areas;
- Using pertinent portions of the FEMA NFIP regulations, 44 CFR Part 60, as a guide for such construction activities, encouraging a broad and united effort to lessen the risk of flood and erosion losses in connection with state lands and installation and state-financed or supported improvements. Specifically, state agencies directly responsible for building structure construction, and other development including grading, paving, and excavation, shall to the maximum extent possible, preclude the uneconomic, hazardous, or unnecessary use of documented flood plains and erosion areas in connection with such development;
- Considering the potential of flood and erosion hazards. Consideration shall be given to setbacks, flood proofing, building elevation, and erosion control measures in flood and erosion-prone areas;
- Evaluating flood and erosion hazards in connection with lands or properties proposed for disposal and, in order to minimize future state expenditures for protection and disaster relief, shall consider including within all new subdivision proposals and other proposed developments greater than 50 lots or 5 acres, whichever is the lesser, base (100) year flood elevation data, or information on approximate flood risks; and
- Taking flood and erosion hazards into account when evaluating plans and permits and encouraging land use approximate to the degree of hazard involved.

As the designated State Coordinating Agency for the NFIP, DCRA was also responsible for the implementation of Alaska's Map Mod program. DCRA additionally fulfills Commerce's charge through two State Administrative Orders (231 and 239) "to act as the state coordinating agency to coordinate with the other state and federal agencies to propose long-term solutions to the ongoing erosion issues in... affected coastal communities..."

DCRA's mission to advise and assist Alaska's local governments, the Division's directive to coordinate with other state and federal entities on behalf of Alaska's local governments regarding erosion hazards, and the Division's historical role in coordinating the NFIP and flood mapping in Alaska make it an effective and appropriate agency to serve as the State Cooperating Technical Partner with FEMA and to coordinate Alaska's Risk MAP Program.

Figure 19: Ice Jam Flooding in Galena, Spring 2013

Photo: Ed Plumb, National Weather Service

Alaska's RISK MAP Program

In order for Alaska's communities to make informed risk management decisions, a consistent risk-based approach to mapping 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 deliver quality data that increases public awareness and promotes local government action that reduces risk to life and property. Alaska Risk MAP activities will focus on the acquisition of data related to flood hazards as well as other types of hazard information.

As proposed in 2009, the *Alaska Mapping Business Plan* identifies gaps in flood hazard data and provides a context for effectively communicating the State of Alaska's mapping priorities. As envisioned, the *Alaska Mapping Business Plan* includes:

- An inventory of existing data;
- Criteria for establishing mapping priorities;
- A prioritized list of mapping needs; and
- Recommendations for future action.

DCRA's overall goals in updating Alaska's mapping business plan and conducting a thorough planning effort is to make the most effective use of FEMA mapping activities, compile and update data on flood and other hazards, provide the greatest leverage from data-gathering and mapping activities by other state and federal agencies, and ensure mapping priorities are based on objective needs and benefits criteria. Furthermore, the *Alaska Mapping Business Plan* provides a framework for future action to become an active Cooperating Technical Partner in the Risk MAP Program, including options, challenges, and resources needed to execute the Risk MAP strategy in Alaska.

Role of the CTP Coordinator

Central to the implementation of Alaska's Risk MAP Program is the CTP Coordinator. The Alaska CTP Coordinator will serve as the intermediary and primary point of contact between Alaska's local governments and FEMA and FEMA's agents for Alaska's Risk MAP Program. Consistent with FEMA's Risk MAP goals, the Alaska CTP Coordinator will collaborate with other state, local, and tribal entities to facilitate mapping partnerships in order to update flood hazard data and maps and to ensure updated information is used in making informed decisions regarding planning, community development, and hazard mitigation.

The CTP Coordinator will support local communities and FEMA Region X by implementing an integrated programmatic strategy to mapping flood hazards, performing risk assessments, informing hazard mitigation plans and acquiring detailed topographic data.

Because the NFIP is also administered by DCRA, the CTP Coordinator is able to work closely with the NFIP Coordinator, to collaborate on common programmatic goals, objectives and tasks and to ensure that the needs and concerns of NFIP-participating communities are integrated into Risk MAP activities.

Figure 20: Ice Jam on the Kenai River, 2007

ALASKA RISK MAP DATA ACQUISITION, ANALYSIS AND PRIORITIZATION OF FUTURE STUDY NEEDS

In order to better align the goals and vision of the State of Alaska's Risk MAP Program with the goals and vision of FEMA's Risk MAP Program, DCRA established the FY2010 task of acquiring relevant mapping data, analyzing that data, and prioritizing the State of Alaska's future study needs.

To accomplish this, state agencies and local communities were coordinated with to obtain information and data necessary for the prioritization of mapping needs. A consulting firm, URS, Inc., was hired to carry out this process. The process of data acquisition, analysis, and prioritization of future study needs is discussed in the sections that follow.

Alaska Mapping Data

The first step in the development of a tool to prioritize Alaska's future study needs is the collection of the appropriate data. State, Federal, regional, local and private entities were contacted to obtain information and data necessary for the prioritization of mapping needs in Alaskan communities participating in the NFIP. The information collected includes previously unidentified needs, significant climatological changes, planned future development, available topographic data, and available digital data depicting the built environment that are necessary for flood risk assessments. Depending on the nature of the information, the collected information was catalogued within an Excel Workbook, *AK-Data_Summary.xlxs*, or an ESRI ArcGIS geodatabase.

State and Local Data

The Alaska Mapping Business Plan recognizes 163 incorporated municipalities of which only 32 participate in the NFIP. Since the current Risk MAP focus is to update flood maps, data collection, analysis and prioritization of mapping needs focuses on NFIP-participating communities. A variety of state and local sources were utilized to acquire needed data.

Community Specific Data Collection

This effort focused on fulfilling the Mapping Business Plan's stated purpose and objectives identified in "Future DCRA Risk MAP Business Plan (MBP) Goals, Task 1B:

- Compile and update data on flood and other hazards
- Determine community specific previously unidentified needs
- Determine climatological changes and unidentified impacts
- Identify future planned development which could impact floodplains
- Identify the availability of newly acquired community specific topographic data
- Identify built environment dataset availability and quality

- Determine mitigation plan quality

The data collection and analysis effort entailed contacting State, Federal and local governments participating in the NFIP along with private entities to gather required data to fill the MBP data gaps. For the most part, community representatives willingly and enthusiastically supplied needed information viewing their involvement as having a two-fold benefit – the opportunity to potentially receive funding while simultaneously improving their ability to fulfill their floodplain management responsibilities.

The project included developing individual NFIP participant questionnaires to assess data gaps addressed in the first MBP Goal and its associated Task 1B. The completed questionnaires will provide essential data to support MBP updates and/or inclusion within the plan.

A review of the questionnaire responses reveals that planning, zoning, geographic information systems (GIS), topographic data availability, and community resource capability or capacity is directly related to the community size, affected population, rural location, and hazard risk. The smaller, more rural communities have severely limited capacity to develop or regulate building construction. However, most all communities do guide land-use to ensure new construction does not occur within known hazard zones. The completed questionnaires demonstrate these building code or land-use regulation and enforcement inconsistencies.

It is imperative to the majority of the participating communities that new flood hazard assessments be accomplished to obtain up-to-date flood hazard maps. Their maps are 20 to 60 years old, topography, development, and populations have changed along with associated infrastructure improvements. Consequently the current flood maps do not reflect current conditions and associated hazard risks. Most of these communities rely on historical flood impact knowledge to manage their floodplain because their paper maps no longer adequately identify impact areas. Digitized maps will not make a difference for rural communities with limited technological capabilities, because they cannot afford GIS, staff to manipulate the information, or in some cases the capability to contract this service out.

Additionally, a need was identified for a mechanism to re-adjust ongoing flood map updates to incorporate newly available data that would in some cases drastically change the in-progress map's impact areas, especially as the schedules for these flood map updates span multiple years. For example, the following is an excerpt from the Fairbanks North Star Borough questionnaire response:

> *"The current restudy effort was started in 2006 and is one of FEMAs last MAP Mod projects. Only a portion of the FIRM is being restudied and will be digital upon final adoption. FNSB successfully appealed certain elements of the revision upon review of the initial drafts first released in June of 2009.*

The successful appeal was possible in large part due to updated hydrology gathered by the Alaska Railroad in their Conditional Letter of Map Revision (CLOMR) application associated with their proposed new bridge crossing of the Tanana River."

The [Alaska Railroad] ARRC CLOMR process uncovered previous mapping shortfalls on the part of the FEMA mapping contractor which has delayed finalizing the FIRM updates. The CLOMR application essentially showed how the model used by FEMA in their mapping was flawed. As well, FEMA underwent a contractor change-over, which has further delayed release of the new DFIRMS. Additionally, FEMA headquarters made a "levee policy" change nationwide, which has also adversely affected the timely adoption of the DFIRMs.

In the meantime, [Fairbanks North Star Borough] FNSB has since acquired new LIDAR (very accurate with 2' contours which includes the Boroughs unnumbered "A Zones") from the Corps of Engineers. FEMA has stated that is simply not possible due to funding and time constraints. It is essential that this new LIDAR information be included in this current map revision. Risk MAP restudies for large areas of populated unnumbered A zone areas will take years to accomplish."

The collected information and data is compiled and available and included in ***AK_data_summary.xlsx*** and supports the MBP's future study needs assessment for the participating NFIP participating communities.

Federal and Regional Data

Average Annualized Loss

In 2009 FEMA initiated the Average Annualized Loss (AAL) Study to provide a Nationwide Loss Dataset. The analysis was performed using HAZUS-MH for every county in the contiguous United States. Annualized losses are maximum potential losses for a given year based on five return periods (10, 50, 100, 200, and 500yr). Unfortunately, the State of Alaska was not included in this analysis. Even though no AAL exists for the State of Alaska, it is mentioned and being considered as a potential future dataset as it is an important data gap in the current FEMA prioritization methodology.

- 2009 Population
- Population Increase 1980-2009
- Population Increase 2009-2019
- 2009 Housing Units
- Single Claims
- Policies
- Number of Repetitive Losses
- Number of Repetitive Loss Properties
- Average County Fed Disasters (As Of 7/2009)
- Total NHD Miles + Coastal W Inlets - Federal NHD Miles

Non-Average Annualized Loss

This dataset was used to generate the flood risk deciles used in the Flood Map Modernization (Map Mod) program. The decile calculations included the use of several national datasets including:This data is summarized on a HUC-8 watershed basis and is included in AK_data_summary.xlsx

Census Data

The most recent 2010 census data was collected as supporting information to the Community Boundaries and Information. Some of the parameters that will be used in the prioritization of future studies may be weighted by population in order to determine relative risk. This data is organized by census block and is presented in the ***AK_Sequencing.gdb***.

Community Boundaries and Information

Community information from three separate sources (State Data, Census Data, and FEMA); was collected and compared. The State uses FIPS and CID numbers found in FEMA's CIS database. However, many communities do not have a number because they are outside a designated borough but are located in Alaska's "Unorganized Borough." The databases also had misspellings, incomplete community names, and other inconsistencies exacerbating database search difficulties. NFIP participating municipalities located in the Unorganized Borough are listed by census area and contiguous boundaries have been developed by FEMA. These boundaries are located as the feature class *AK_Communities_FEMA* found within the ***AK_Sequencing.gdb*** geodatabase. These contiguous boundaries will be used in the prioritization of future studies.

Data Comparison

A comparison of the three data sources is shown in the table on the next page and the resolution to the inconsistencies is noted in the last column.

Table 25: Comparison of Data Sources on Alaska Communities

Community FIPS from State Data Community List & FEMA's Community Status Book		Community FIPS from 2010 Census Data		Community FIPS from FEMA		Notes
Borough	FIPS	Borough	FIPS	Borough	FIPS	
Aleutian Islands	02010					FIPS 02010 covered by STCOFIPS 02013 and 02016
		Aleutians East	02013	Aleutians East	02013	
		Aleutians West Census Area	02016	Aleutians West	02016	
Anchorage Division	02020	Anchorage Municipality	02020	Anchorage	02020	
Angoon Division	02030					FIPS 02030 covered by STCOFIPS 02232
Barrow-North Slope Division	02040					FIPS 02030 covered by STCOFIPS 02185
Bethel Div.	02050	Bethel Census Area	02050	Bethel	02050	
Bristol Bay	02060	Bristol Bay	02060	Bristol Bay	02060	
		Denali	02068	Denali	02068	
Dillingham	02070	Dillingham Census Area	02070	Dillingham	02070	
Emmonak-Unorganized Borough	02999					FIPS 02999 covered by STCOFIPS 02270
Fairbanks North Star	02090	Fairbanks North Star	02090	Fairbanks North Star	02090	
Haines	02100	Haines	02100	Haines	02100	
		Hoonah-Angoon Census Area	02105			02105 C. A. covered by STCOFIPS 02232
Juneau Division	02110	Juneau	02110	Juneau	02110	
Kenai Peninsula	02122	Kenai Peninsula	02122	Kenai Peninsula	02122	
Ketchikan Gateway	02130	Ketchikan Gateway	02130	Ketchikan Gateway	02130	
Outer Ketchikan Division	02190					FIPS 02190 covered by STCOFIPS 02201
Kobuk Division	02140					FIPS 02140 covered by STCOFIPS 02188
Kodiak Island	02150	Kodiak Island	02150	Kodiak Island	02150	
Kuskokwim Division	02160					FIPS 02160 covered by STCOFIPS 02290
Lake and Peninsula	02164	Lake And Peninsula	02164	Lake and Peninsula	02164	
Matanuska-Susitna	02170	Matanuska-Susitna	02170	Matanuska-Susitna	02170	
Nome Division	02180	Nome Census Area	02180	Nome	02180	
North Slope	02185	North Slope	02185	North Slope	02185	
Northwest Arctic	02188	Northwest Arctic	02188	Northwest Arctic	02188	
Prince of Wales Div.	02201			Prince of Wales-Outer Ketchikan	02201	
Sitka Division	02220	Sitka City and Borough	02220	Sitka	02220	
Skagway-Yakutat Division	2230	Skagway Municipality	02230			02230 Census Area covered by STCOFIPS 02232
				Skagway-Hoonah-Angoon	02232	

***(continued)* Table 25: Comparison of Data Sources on Alaska Communities**

Community FIPS from State Data Community List & FEMA's Community Status Book		Community FIPS from 2010 Census Data		Community FIPS from FEMA		Notes
Borough	FIPS	Borough	FIPS	Borough	FIPS	
Southeast Fairbanks	02240	Southeast Fairbanks Census Area	02240	Southeast Fairbanks	02240	
Upper Yukon	02250					FIPS 02250 covered by STCOFIPS 02290
Valdez-Chitina	02260					FIPS 02261 covered by STCOFIPS 02261
Valdez-Cordova	02261	Valdez-Cordova Census Area	02261	Valdez-Cordova	02261	
Wade Hampton Division	02270	Wade Hampton Census Area	02270	Wade Hampton	02270	
Wrangell-Petersburg	02280			Wrangell-Petersburg	02280	
		Yakutat	02282	Yakutat	02282	
Yukon-Koyukuk	02290	Yukon-Koyukuk Census Area	02290	Yukon-Koyukuk	02290	
		Unnamed Census Area	02195			02195 Census Area covered by STCOFIPS 02280
		Unnamed Census Area	02198			02198 Census Area covered by STCOFIPS 02201
		Unnamed Census Area	02275			02275 Census Area covered by STCOFIPS 02280

Coordinated Needs Management Strategy (CNMS) data

CNMS is a FEMA initiative to update the way FEMA organizes, stores, and analyzes flood hazard mapping needs information for communities. It defines an approach and structure for the identification and management of flood hazard mapping needs that will provide support to data driven planning and the flood map update investment process in a geospatial environment. Every stream and coastal reach nationwide is currently being assessed to determine its status.

For the State of Alaska, approximately 1,000 stream miles have been inventoried and analyzed to determine whether the stream or coastal miles meets its criteria of New, Validated or Updated Engineering (NVUE). The question CNMS will address is whether a stream (or coastal) segment is NVUE compliant. The dataset provided by FEMA shows all stream miles within Alaska as either being "Not Valid" or "Requires Assessment". According to STARR, Production and Technical Services (PTS) contractor for FEMA Region X, it is important to note that for the current CNMS inventory for Alaska in general, only FEMA's digital data was evaluated so if the area didn't have a DFIRM then it was unlikely to make it into the evaluation process. This means that participating communities with paper maps only do not have their flooding sources reflected in the current CNMS database.

Because the CNMS dataset is inherently a GIS database, it has been left in its original format – as a separate geodatabase.

Available Topography

FEMA tasked the Risk MAP Production and Technical Services (PTS) contractors to develop a Geospatial Data Inventory (GDI) of available high-quality elevation data across the Nation. The results of their efforts are summarized in a report titled *Geospatial Coordination High Resolution Topographic Inventory, Version 1.0* dated May 31, 2010.

A summary for Alaska is extracted from that report is provided as follows:

> *"Alaska – A majority of existing elevation data is located within the Kenai Peninsula Borough including several LiDAR datasets for the City of Seward flown in 2006 and 2009 (15 cm RMSE vertical accuracy) as well as several USGS-provided datasets covering a majority of the peninsula. Age and vertical accuracy information for this data is currently unknown. Additional LiDAR data is available for the North Slope and Yukon-Koyukuk Boroughs in northern Alaska. Vertical accuracy (where known) for most elevation data in Alaska ranges from 5-30 cm RMSE and would support 0.5-4 foot contours. Existing datasets were created in 2007 or more recently. Major source contributors included USGS's CLICK website, OpenTopography.com, state and local contacts. Very little high-resolution topographic data exists for Alaska. Several important LiDAR projects are planned for 2011 in areas within Mat-Su Borough as well as coastal areas within the Municipality of Anchorage."*

Local communities were also questioned as to the availability of topographic data. This data is summarized on a community basis and is included in ***AK_Data_Summary.xlsx*** , and includes datasets not identified in the GDI described above such as the newly acquired LiDAR in 2011 for the Mat-Su Borough.

Letters of Map Change (LOMC)

LOMCs, specifically Letters of Map Amendments (LOMAs), can be used as an indicator that a map may need revision. Letters of Map Revision (LOMR) have been excluded from this dataset because, by definition, approved LOMRs already address the mapping need and are the effective NFIP document for the area covered by the LOMR restudy. LOMAs can be summarized on a borough, community, or flooding source basis. This dataset is included in Tab 12, ***AK_Data_Summary.xlsx*** (see also Appendix 1, Table 8).

Mitigation Plans

The latest report to FEMA regarding the status of Mitigation Plans was dated June 24, 2011. The dataset includes FIPS, CID, and population information for jurisdictions added in May 2011 from the FEMA Community Layer.

The presence of active mitigation plans indicates those communities are proactive in managing flood related risks. Therefore, those watersheds with a high percentage of their areas intersecting communities with mitigation plans in place are usually given a higher priority for future studies. Local communities were also questioned as to the availability of mitigation plans. This data is summarized on a community basis and is included in Tab 7, AK_Data_Summary.xlsx (see also Appendix 1, Table 7).

Non-Compliance with the NFIP

When attempts to resolve enforcement problems through community assistance or consultation have failed, the FEMA Regional Director may place a community on probation. The probationary period lasts at least until all program deficiencies have been corrected and violations have been remedied to the maximum extent possible, and it may be extended for up to one year after that. Probation has no effect on the continued availability of flood insurance. If the community fails to take remedial measures during the probationary period, the Regional Director may recommend suspension from the NFIP which would prevent residents from obtaining flood insurance. A community may also be reinstated on probationary status after having been suspended. This data is summarized on a community basis and is included in Tab 6, ***AK_Data_Summary.xlsx***.

Community Rating System (CRS)

The CRS is a voluntary program for NFIP-participating communities. Information on the State of Alaska's current listings of all CRS communities, their class, and insurance discount has been collected and are summarized on a community basis. It is included in Tab 4, ***AK_Data_Summary.xlsx***.

Declarations

A Major Disaster could result from a hurricane, earthquake, flood, tornado, or major fire which the President determines warrants supplemental federal aid. To be considered for this aid the impacts of such an event must clearly exceed the capability of state or local governments' resources or capability to manage the consequences alone. If declared, funding comes from the President's Disaster Relief Fund, which is managed by FEMA, and disaster aid programs of other participating federal agencies. Data for the State of Alaska was pulled from FEMA and is included in Tabs 9 and 10, ***AK_Data_Summary.xlsx*** (see also Appendix 1, Table 7).

Federal Insurance Administration (FIA)

Flood insurance information was collected from the FIA. It contains the number of single claims, the number of policies in effect, the number of repetitive losses, and the number of repetitive loss properties summarized at the borough level. The data for the State of Alaska is included in ***AK_Data_Summary.xlsx*** (see also Appendix 1, Table 4.)

Hazard Mitigation Grant Program (HMGP)

Participation in FEMA's HMGP can give a good indication that a community is willing to mitigate the risks of flood hazards. Data for the communities within the State of Alaska participating in HMGP was pulled from FEMA and is included in Tab 5, ***AK_Data_Summary.xlsx*** (see also Appendix 1, Table 8).

Alaska Prioritization and Future Studies Sequencing Decision Support System

Overview

The Alaska Prioritization and Future Studies Sequencing Decision Support System is a ranking methodology intended to provide relative comparisons between watersheds based on a number of normalized factors in the State of Alaska. It provides an analysis of information gathered on a local, state, and nationwide basis to provide a prioritization list of Alaskan watersheds to be studied under FEMA's Risk MAP Program. The term "county" used throughout this report is synonymous with the State of Alaska's "borough" and "census area" classifications.

Building upon the concept of the Risk MAP 'trifecta' approach employed in the Fiscal Year 2011 (FY11) Algorithm, this solution incorporates several additional datasets, grouping them by type, and allowing users to assign customized weighting to each of the contributing factors. While the FY11 algorithm compares absolute values of one watershed to absolute values of another watershed for Flood Risk, Need and Topographic Coverage, this new approach leverages state and local considerations based on community input to develop a ranking of Hydrologic Unit Code (HUC) 8 watersheds within Alaska. It considers the local preferences for prioritization, such as climatological change, local hazard mitigation plans, planned future development, coastal exposure, etc. Special considerations are given to communities with plans in need of updating and with an expressed interest in plan improvement or development.

A total of 16 Indicators have been considered. Individual indicators have been grouped into one of the following three factors: Flood Risk, Needs, and Action Potential. The system is built in a robust and user-friendly environment that allows users to modify the contribution of each factor (or each indicator) based on local knowledge and preference. Instructions for viewing and modifying the weights for the various ranking factors are embedded in the spreadsheet tool, ***Alaska_Risk MAP_Prioritization.xlsx .***

Acquired/Standardized Data

Various datasets were identified, collected, assembled, and analyzed through the process. Data was obtained from different sources, such as federal, regional, and state agencies, as well as local communities. The focus of this effort was to collect the best available and most up-to-date data to optimize the accuracy of the information used in the decision making process. The table below provides a detailed list of datasets which were used in the prioritization process. Each indicator was classified into one of three factors: Flood Risk, Needs, and Action Potential. These factors, as well as individual indicators, were incorporated into the algorithm after normalization by population or area weighting at the HUC-8 level. This is critical when comparing watersheds as it allows for a fair comparison between entities when population numbers and total areas are different from one to another. This evaluation is performed primarily at the HUC-8 level.

Table 26: Datasets Used in the Prioritization Process

Factor	Indicator	Source	Data Collected Date	Resolution	Notes
Flood Risk	AAL	FEMA National Discovery	June 2011	Nation-wide data on FIPS level	Not available for Alaska
	Population	FEMA	2010	Census blocks	
Needs	CNMS	FEMA (STARR)	Oct. 2010	Region-wide data on stream level	No Complete dataset for Alaska available
	Coastal Miles	FEMA		Borough/Census block	FY10 sequencing
	Topographic Coverage	State of Alaska FEMA	Nov. 2011 May, 2010	State-wide data on community level Nationwide data on community level.	
	Community Identified Needs	State of Alaska	Nov. 2011	State-wide data on community level	
	Climatologic Change	State of Alaska	Nov. 2011	State-wide data on community level	
	LOMCs	FEMA MSC	Nov 2011	State-wide data on lat., long level	
	Planned Future Development	State of Alaska	Nov. 2011	State-wide data on community level	
Action Potential	Mitigation Plans	State of Alaska FEMA	Nov. 2011 June, 2011	State-wide data on community level Nationwide data on community level	
	Interest in New Community Plans	State of Alaska	Nov. 2011	State-wide data on community level	
	CRS	FEMA CRS	Oct. 2011	Nationwide data on community level	
	Disaster Declarations	State of Alaska FEMA CRS	Nov. 2011 Aug. 2011	State-wide data on community level Nation-wide data on county level.	
	FIA	FEMA	Dec. 2009	Nationwide data on county level	
	Mitigation Grants	State of Alaska FEMA RSS	Nov. 2011 May. 2011	State-wide data on community level Nation-wide data on county level	
	In-House GIS	State of Alaska	Nov. 2011	State-wide data on community level	

Data Processing

The different types of data provided lend themselves to inclusion in a prioritization algorithm in different ways. To prepare the tables, decisions must be made on data type and normalization method – keeping in mind a consistent ranking method. For the purposes of this analysis we will assume that the lower the rank (1 being the lowest) the more likely a unit (FIPS, CID, HUC) is to be recommended for study (meaning it is considered a higher priority by our system). Since the goal is to make prioritization recommendations, each data table should evaluate how one unit compares to another for the factor described by that data table to the extent possible.

Area/Population Weighting

Depending on the resolution of the contributing datasets, each indicator was first ranked at a watershed (HUC-8), County (FIPS), or Community (CID) level. For factors that existed at a HUC-8 watershed level, the factor rankings transferred directly to the master ranking scheme. For factors ranked at the county or community level, the appropriate area or population weighting was applied to the data such that counties/ communities with a large percentage of their respective area in a given watershed would contribute more to that watershed's eventual ranking for that factor than would the ranking of counties/communities which barely had a footprint in the watershed. The majority of the datasets used are available by political boundaries (CID or FIPS) rather than at the watershed level. The abovementioned method of ranking HUC -8 watersheds based on the area of "influence" of constituent counties/communities ensures that this transition from political boundaries to watershed boundaries is made in a meaningful manner without over- or under-representing the representative strength of the constituent counties/communities.

Considering Types of Data Inclusion – Rank vs. Binary

The data sets which have been collected can contribute to a prioritization calculation in one of two ways; they can either be used to provide a relative ranking for each unit (FIPS or CID depending on the data), or they can provide a binary YES/NO (1/0) for each unit. An example of data lending itself to ranking would be the FIA data, where each unit has its own unique set of attributes (in that case rep loss, properties, etc.). An example of data lending itself to binary inclusion would be the Climate Change table, where each community listed simply as a YES/NO. Much of the locally collected data was processed as a binary data set including Planned Future Development, Topographic Coverage, Community Identified Needs, Mitigation Plans, Interest in New Community Plans, Mitigation Grants, In-House GIS, IAID, and Climatological Change.

Risk Factor

Average Annualized Loss Rank

The Average Annualized Loss (AAL) Rank is a ranking, by watershed, of the total AAL. This starts with a Rank of 1 being the watershed with the highest AAL dollar amount. However, no AAL data analysis was available for Alaska to use on this project. Therefore, all the watersheds had the same ranking and no weighting factor is applied to this indicator. When the AAL data becomes available in the future, the indicator can be introduced to the algorithm. With proper weighting factor, AAL could contribute to the Risk factor.

Population Rank

Population Rank rates the highest population with a value of 1 to indicate that it is the most important, and increases in order to the watershed of lowest population.

Needs Factor

Coordinated Needs Management Strategy (CNMS)

This ranking uses the CNMS inventory to compare mileages within each watershed, which are considered Non-NVUE. New, Validated, or Updated Engineering (NVUE) is the FEMA standard that provides a basis for assessing the engineering analysis used to develop flood elevations. FEMA developed the standard to help mapping partners determine where new study data should be collected, where updates to existing flood hazard data should be performed, and whether previously developed flood study data could still be considered valid. The Non-NVUE category is composed of all paper inventory study miles, as well as any modernized NOT VALID and REQUIRES ASSESSMENT mileage. Higher priority can be given to watersheds with more mileage in this category. The CNMS data for Alaska currently shows that ALL stream miles are Non-NVUE compliant, thus all watersheds will have the same rank for this indicator. Additionally, FEMA's contractor STARR indicated that the only streams currently included in CNMS for the State of Alaska are those currently in DFIRM format. This excludes a large number of streams and makes this dataset incomplete. When the CNMS data is updated and some distinctions between the watersheds can be made, this indicator can be introduced to the algorithm at that time. Ultimately, CNMS should contribute heavily to the Needs factor.

Coastal Miles

Since the CNMS inventory only includes riverine mileages, a significant amount of coastal shoreline mileages within the state of Alaska are not considered. The Coastal Needs indicator addresses the needs of floodplain studies for coastal communities. The indicator ranks all watersheds based on the linear distance of coastline within a watershed as it relates to the overall area of coastal communities within the state. Higher priority is given to watersheds that include more coastal communities.

Topographic Coverage Rank

Topographic data availability was part of the FY11 algorithm and is considered here as an action potential. Here watersheds are ranked based on the percentage of their area that are covered by available topographic coverage (discounting the 30m resolution National Elevation Dataset- NED), with a Rank of 1 representing the watershed(s) with the highest percentage of topographic coverage. The base NED product was discounted based on the National Academy's findings on floodplain analyses and quality elevation data and the associated applicability of this particular dataset.

Community Identified Needs Rank

Community Identified Needs ranking is a weighted value representing the needs which were previously unidentified. Several communities have expressed the need for new or updated flood studies. Higher priority was given to communities that have identified such needs.

Climatological Change Rank

This ranking utilizes local input to identify any significant climatological changes observed in a community. Several communities have reported hydrological impact caused by climatological changes, such as rising sea level, glacier recessions, flooding introduced by glacial dam breaches, melting of permafrost, etc.

This factor evaluates the relative area of a watershed where the impact of significant climatological changes was reported. The watersheds are ranked based on the percentage of their area with significant climatological changes.

LOMC Rank

The Letters of Map Change (LOMC) ranking is a combined weighted value representing the presence and number of LOMCs within communities located in specific watersheds. Higher priority was given to watersheds including communities with greater numbers of processed LOMCs.

Planned Future Development Rank

This ranking utilizes the local inputs to identify any planned future development in a community. It evaluates the area of planned future development within a watershed as it relates to the overall area within the State of Alaska. A rank of 1 indicates a watershed which has seen the highest percentage of area that has planned future development. This is considered a Need because the planned future development is an indicator of future urbanization where the new physical environment is no longer being represented appropriately in the engineering model and on the map.

Action Potential Factor

Mitigation Plan Rank

The Mitigation Plan ranking is a weighted value indicating the presence of active mitigation plans within communities located in a watershed. Higher priority was given to those watersheds of which higher percentages of their respective areas included communities with mitigation plans in place.

Interest in New Community Plans

The Interest in New Community Plans ranking is a weighted value indicating the willingness of communities to either update their plans or develop new community plans. Higher priority was given to watersheds of which higher percentages of their respective areas included communities with community plans in place.

Community Rating System Rank

The Community Rating System (CRS) ranking is a combined weighted value representing the CRS rating of communities located in each of the watersheds. Higher priority was given to watersheds that included communities with a better overall CRS rating. In essence, communities that are more in compliance and have a better CRS rating will contribute positively to achieving the goals of Risk MAP.

Disaster Declarations Rank

The Disaster Declarations ranking is a weighted value indicating the presence of communities within the watershed that have a history of declared flood disasters. Higher priority was given to watersheds that have more disaster declarations with the thought that communities that have had disasters declared are more likely to value and implement mitigation action to limit the scope of the impact in the future. It also provides a part of the outreach communications.

Flood Insurance Administration Rank

The Flood Insurance Administration (FIA) ranking is a combined weighted value representing claims, policies, repetitive loss, and repetitive loss properties intersecting the watersheds using a per capita, per unit area normalization. Higher priority was given to watersheds that included communities with high occurrences of these factors per capita per unit area.

Mitigation Grants Rank

The Grants ranking is a combined weighted value representing presence of ongoing/recent studies within the communities or portions thereof within each of the watersheds. Higher priority was given to areas receiving greater mitigation grants. This is based on the assumption that because these communities have received mitigation funding recently, they could be more likely to improve their communities in other ways.

In-House GIS Rank

The In-House GIS ranking is an indicator of the community's capability to participate in the Risk MAP Program. A community with a strong in-house GIS program and proper supporting staff is more likely to carry out relevant aspects of the Risk MAP Program. Higher priority was been given to watersheds, which have the higher percentages of their areas intersecting communities with a confirmed In-House GIS program.

Application of the Prioritization and Future Studies Sequencing Decision Support System

The ***Alaska_Risk MAP_Prioritization.xlsx*** spreadsheet has eight tabs: Factor_Weights, HUC-8_Rankings, Scenarios, HUC_Rank, HUC_Summary, AK_Master, State_data_Summary, and NFIP.

The "Factor_Weights" tab allows the users to adjust the weighting factors based on community preferences. Initially, all editable fields (colored yellow) have been set to recommended weights. Users have the ability to evaluate the relative importance of three factors of Risk, Needs, and Action potential. In addition, users can adjust each indicator under subgroups if desired. Changing values in this tab will result in a new watershed prioritization within the 'HUC-8_Rankings' Tab.

The "HUC-8_Rankings" tab provides a summary of HUC-8 watershed's prioritization based on the user-specified weighting factors that are shown in the "WorkSheet" tab.

The "Scenarios" tab allows the user to capture certain weighting factor scenarios and compares the prioritization results side-by-side. Four pre-rendered scenarios are provided. The four scenarios are titled: Typical, Need Heavy, Risk Heavy, and Action Heavy with the most weight applied to their respective primary factor. The watershed rankings are conditionally formatted to allow for quick identification of high priority watersheds and can be sorted in a variety of ways.

Scenarios can be added using the instructions found within the "Adding Scenarios" section of this report. Both the "HUC_Summary" and "HUC_Rank" tabs show the rolled up summary watershed scores and rank tables resulting from the "AK_Master" analysis.

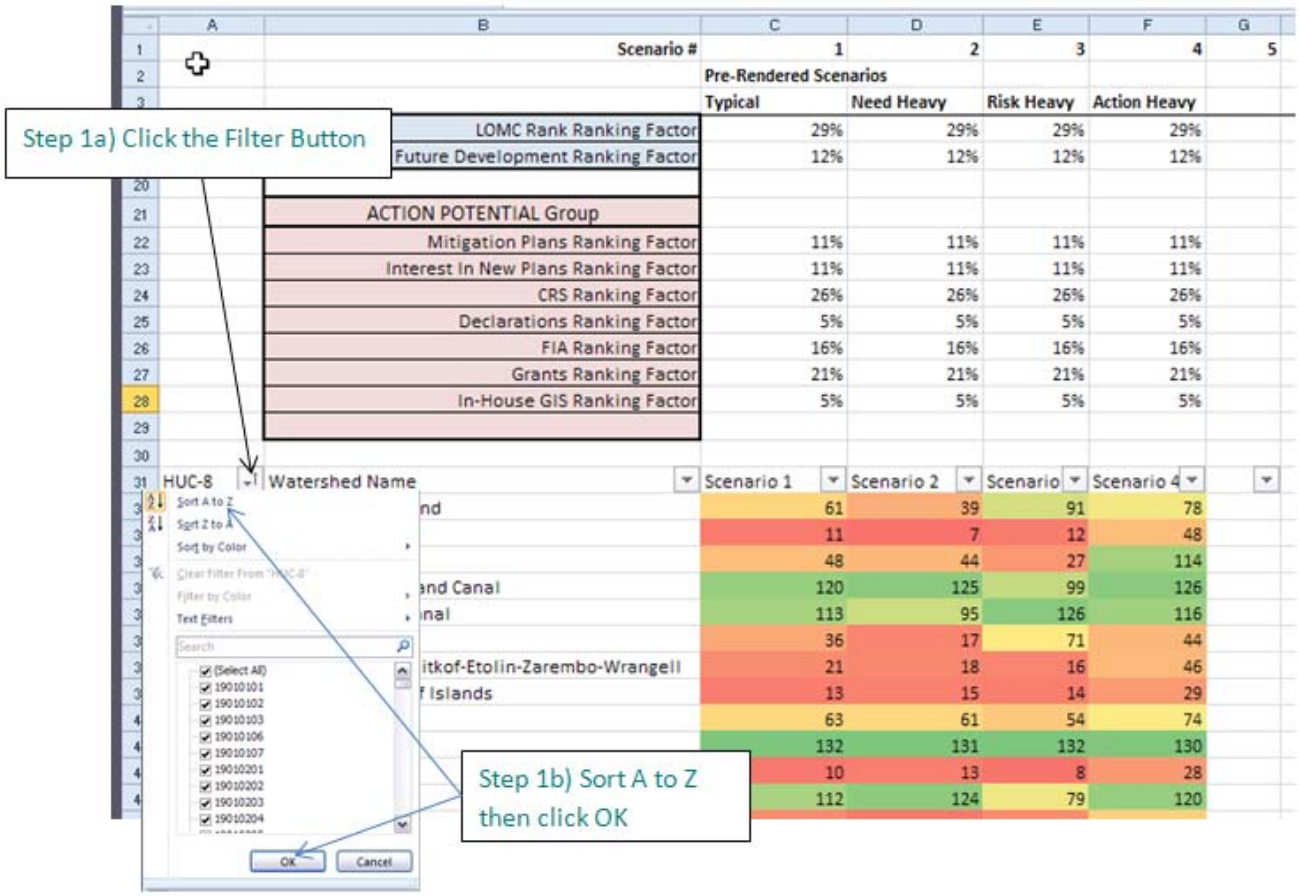
The "AK_Master" worksheet contains both the results of the GIS intersection of the Watershed, Community, FEMA borough, and Census boundaries as well as all of the required data manipulations to produce the required indicator scores.

The "State_Data_Summary" worksheet contains the summary of the local data provided by those communities participating in the NFIP. It also contains the binary and relative ranking summary data for this local data used in the "AK_Master" worksheet.

The "NFIP" worksheet summarizes the watershed rankings in relation to the NFIP participating community.

Adding Scenarios

Step 1: Ensure that the HUC-8 data and their respective rankings are sorted in ascending order. Clicking the filter tab button will generate a popup that will allow sorting in ascending order.



Step 2 and 3) Adjust the weighting factors and copy them into the Scenario's work-tab to identify the weighting scheme for this particular scenario.

Use Tier 1 Adjustments below if you desire shift the influence of each factor around.

Tier 1 Ranking Factors Weights Adjustment

Rate the following On a scale on 1-10 of relative importance between the 3 subgroups of Risk, Needs and Action Potential. Ratings directly translate to relative weights.

Factor	Suggested Weight Rating (1-10 ; 10 is heaviest weight)	User: Select Weights Below	Effective Percentage Weights used in calculations
RISK	6	3	30%
NEEDS	10	5	50%
ACTION POTENTIAL	4	2	20%

Use Tier 2 Adjustments below if you desire to further refine the weighting of ranks within each factor's sub-group

Tier 2 Ranking Factor Weights Adjustment *(optional)*

Rate the following On a scale on 1-10 of relative importance within each subgroup of Risk, Needs and Action Potential. Think of the total within each subgroup as a score. The rating number assigned to each moves the weight around as seen in the effective weighting % shown in the side in Column D

Note: For a description of the ranks below, please see documentation provided along with this spreadsheet

Sub-factors	Suggested Weight (1-10 ; 10 is heaviest weight)	User: Select Weights Below	Effective Percentage Weights used in calculations
RISK Group			
AAL Ranking Factor	8	0	0%
Population Ranking Factor	5	5	100%
NEEDS Group			
CNMS Ranking Factor	8	0	0%
Coastal Needs Ranking Factor	6	6	26%
Topo Coverage Rank Ranking Factor	6	6	26%
Community identified needs Ranking Factor	2	2	9%
Climate Change Ranking Factor	2	2	9%
LOMC Rank Ranking Factor	5	5	22%
Planned Future Development Ranking Factor	2	2	9%
ACTION POTENTIAL Group			
Mitigation Plans Ranking Factor	4	4	11%
Interest In New Plans Ranking Factor	4	4	11%
CRS Ranking Factor	10	10	28%
Declarations Ranking Factor	2	2	6%
FIA Ranking Factor	6	6	17%
Grants Ranking Factor	8	8	22%
In-House GIS Ranking Factor	2	2	6%

Step 2a) Adjust User Selected Weights to the desired weighting scheme (yellow cells)

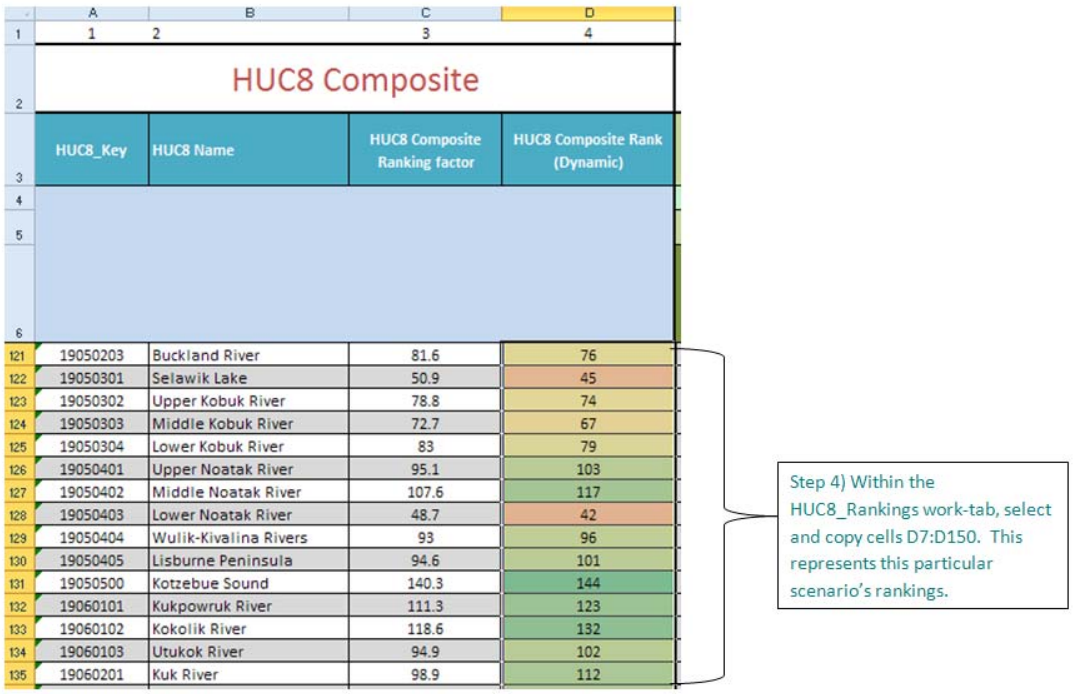
Step 2b) Copy User Selected Weights for input into Scenario's Tab

Scenario #	1	2	3	4	5	6
	Pre-Rendered Scenarios					
	Typical	Need Heavy	Risk Heavy	Action Heavy		
RISK	3	1	7	1		
NEEDS	5	8	2	2		
ACTION POTENTIAL	2	1	1	7		
RISK Group						
AAL Ranking Factor	0	0	0	0		
Population Ranking Factor	5	5	5	5		
NEEDS Group						
CNMS Ranking Factor	0	0	0	0		
Coastal Needs Ranking Factor	6	6	6	6		
Topo Coverage Rank Ranking Factor	6	6	6	6		
Community identified needs Ranking Factor	2	2	2	2		
Climate Change Ranking Factor	2	2	2	2		
LOMC Rank Ranking Factor	5	5	5	5		
Planned Future Development Ranking Factor	2	2	2	2		
ACTION POTENTIAL Group						
Mitigation Plans Ranking Factor	4	4	4	4		
Interest In New Plans Ranking Factor	4	4	4	4		
CRS Ranking Factor	10	10	10	10		
Declarations Ranking Factor	2	2	2	2		
FIA Ranking Factor	6	6	6	6		
Grants Ranking Factor	8	8	8	8		
In-House GIS Ranking Factor	2	2	2	2		

HUC-8	Watershed Name	Scenario 1	Scenario 2	Scenario	Scenario 4	Scenario 5	Scenario 5	Scena
19010101	Southeast Mainland	61	39	91	78			
19010102	Ketchikan	11	7	12	48			
19010103	Prince of Wales	48	44	27	114			
19010106	Headwaters Portland Canal	120	125	99	126			
19010107	Outlet Portland Canal	113	95	126	116			
19010201	Mainland	36	17	71	44			
19010202	Kuiu-Kupreanof-Mitkof-Etolin-Zarembo-Wrangell	21	18	16	46			
19010203	Baranof-Chichagof Islands	13	15	14	29			
19010204	Admiralty Island	63	61	54	74			
19010205	Lower Iskut	132	131	132	130			
19010301	Lynn Canal	10	13	8	28			

Step 3) Paste the weightings into the appropriate Scenario column for documentation and comparison

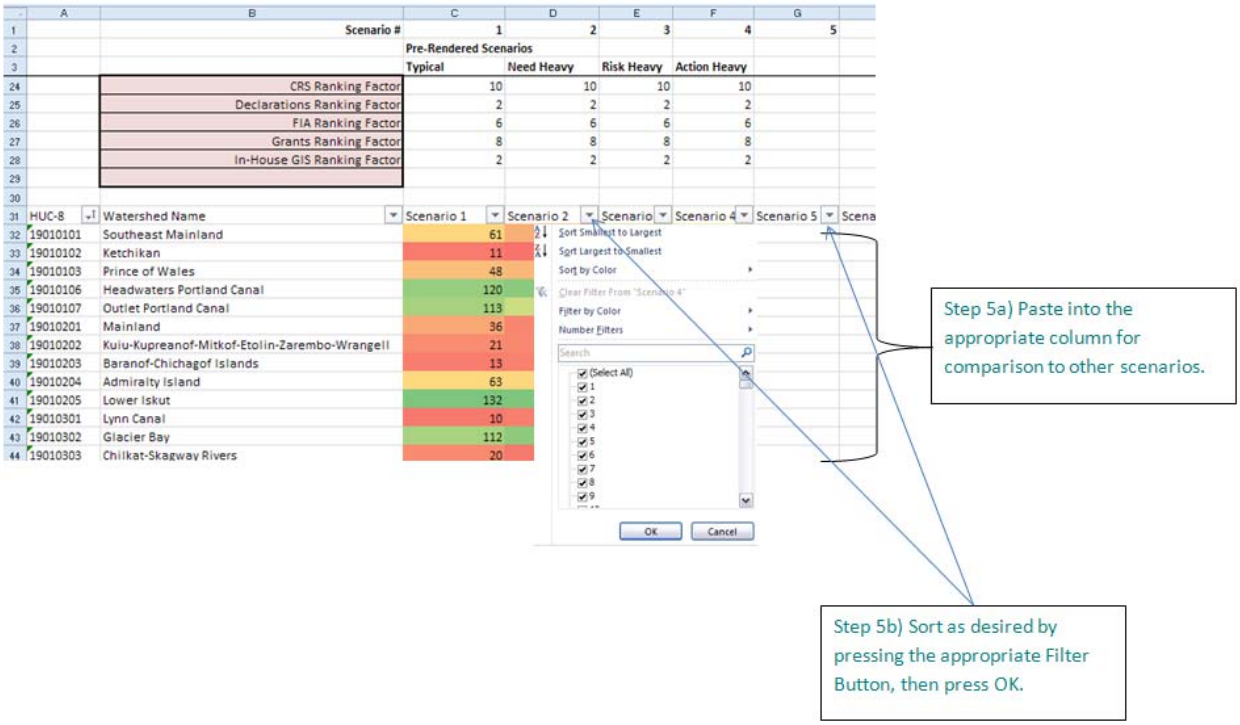
Step 4 and 5) Select and copy the watershed rankings then paste them into the Scenario worktab. Once pasted in, the results will be color coded according to the ranking. Sorting is performed by pressing the filter button and sorting as desired.



HUC8 Composite

HUC8_Key	HUC8 Name	HUC8 Composite Ranking factor	HUC8 Composite Rank (Dynamic)
19050203	Buckland River	81.6	76
19050301	Selawik Lake	50.9	45
19050302	Upper Kobuk River	78.8	74
19050303	Middle Kobuk River	72.7	67
19050304	Lower Kobuk River	83	79
19050401	Upper Noatak River	95.1	103
19050402	Middle Noatak River	107.6	117
19050403	Lower Noatak River	48.7	42
19050404	Wulik-Kivalina Rivers	93	96
19050405	Lisburne Peninsula	94.6	101
19050500	Kotzebue Sound	140.3	144
19060101	Kukpowruk River	111.3	123
19060102	Kokolik River	118.6	132
19060103	Utukok River	94.9	102
19060201	Kuk River	98.9	112

Step 4) Within the HUC8_Rankings work-tab, select and copy cells D7:D150. This represents this particular scenario's rankings.



Scenario #	1	2	3	4	5
	Pre-Rendered Scenarios				
	Typical	Need Heavy	Risk Heavy	Action Heavy	
CRS Ranking Factor	10	10	10	10	
Declarations Ranking Factor	2	2	2	2	
FIA Ranking Factor	6	6	6	6	
Grants Ranking Factor	8	8	8	8	
In-House GIS Ranking Factor	2	2	2	2	

HUC-8	Watershed Name	Scenario 1	Scenario 2	Scenario	Scenario 4	Scenario 5	Scena
19010101	Southeast Mainland	61					
19010102	Ketchikan	11					
19010103	Prince of Wales	48					
19010106	Headwaters Portland Canal	120					
19010107	Outlet Portland Canal	113					
19010201	Mainland	36					
19010202	Kuiu-Kupreanof-Mitkof-Etolin-Zarembo-Wrangell	21					
19010203	Baranof-Chichagof Islands	13					
19010204	Admiralty Island	63					
19010205	Lower Iskut	132					
19010301	Lynn Canal	10					
19010302	Glacier Bay	112					
19010303	Chilkat-Skagway Rivers	20					

Step 5a) Paste into the appropriate column for comparison to other scenarios.

Step 5b) Sort as desired by pressing the appropriate Filter Button, then press OK.

Prioritization of Future Mapping Needs

The focus of this work is to provide a baseline for prioritizing future study needs of Alaska's NFIP participating communities. The data collection and analysis results indicate that the Upper Kenai Peninsula (HUC 19020302) should be considered a high priority. The overall ranking for this watershed was insensitive to the weighting distribution scenarios that were tested. Adjacent watersheds also had high prioritization rankings.

The NFIP communities that are located in these high prioritized watersheds include Kenai Peninsula Borough, City of Kenai, Municipality of Anchorage, City of Soldotna, City of Aniak, City of Bethel, City of Kwethluk, City of Emmonak, City of Cordova, and the Matanuska-Susitna Borough. The prioritized rankings are illustrated by the map in Figure 21, next page, and by Table 26 on pages 92 and 93. Table 27 on pages 94-95 provides a listing of NFIP-participating communities by ranked HUC-8 watershed.

In general, the watershed rankings show that the South Central Alaska portions (Anchorage, and Matanuska-Susitna Boroughs) should be given higher priority. The coastal areas for these boroughs as well as the Western Alaska coastal areas (including Bethel and Wade Hampton) also need focused Risk MAP studies.

Completing the CNMS analysis is critical to accomplishing future analysis or updates to this activity. The current CNMS indicator for Alaska currently shows all watersheds will have the same rank. When the CNMS data is updated and some distinctions between the watersheds can be made, this indicator can be introduced to the algorithm at that time. Ultimately, CNMS should contribute heavily to the Needs Factor.

Also, a statewide risk analysis needs to be performed. The risk analysis will define the average annualized losses. When the AAL data becomes available in the future, the indicator can be introduced to the algorithm. With proper weighting factor, AAL could contribute to the Risk factor.

Figure 21: Map of Rankings of Watersheds Based on Scenario 1

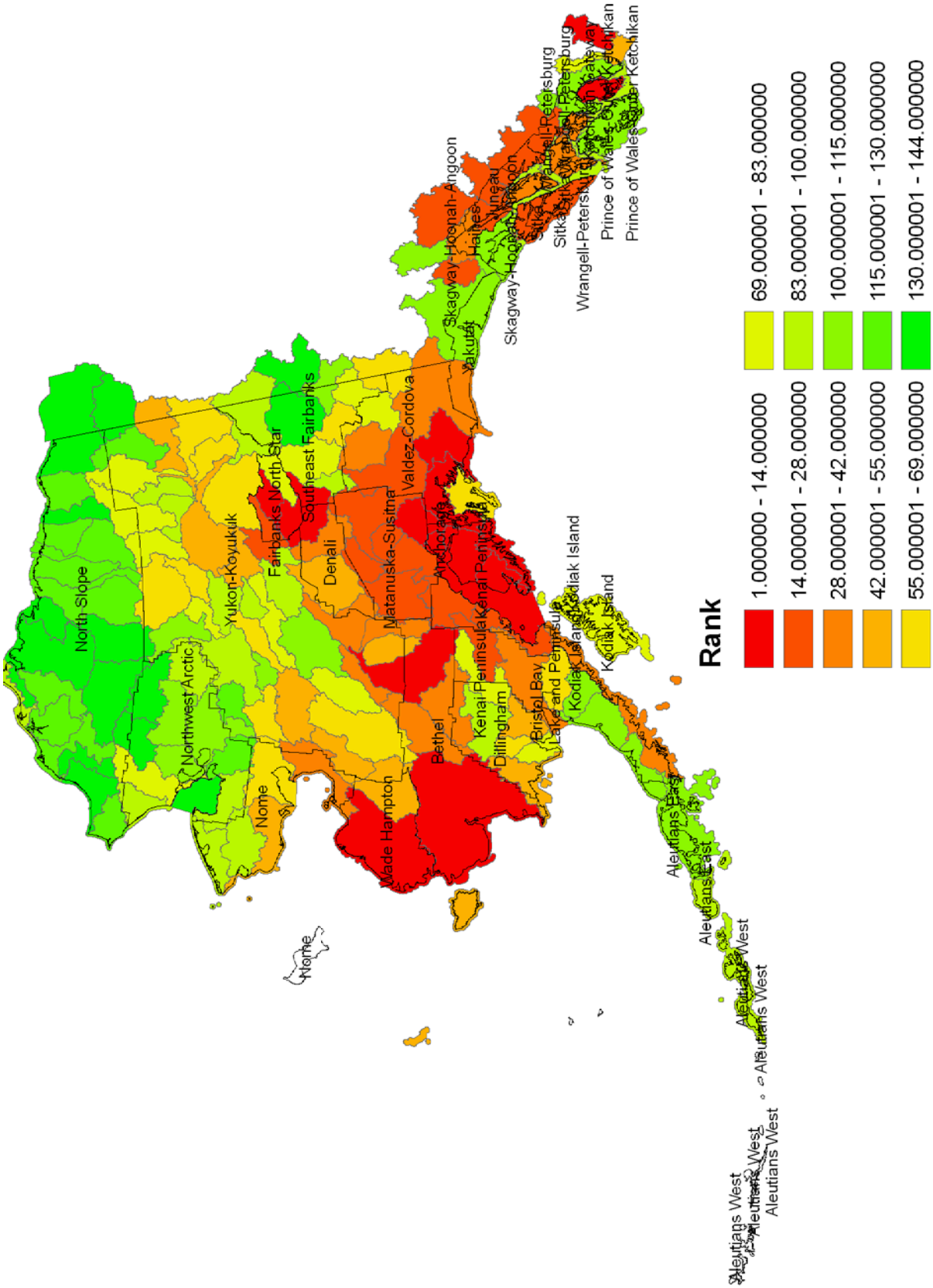


Table 27: Ranking of Alaska's HUC-8 Watersheds Based on Scenarios 1-4

HUC-8	Watershed Name	Scenario 1	Scenario 2	Scenario 3	Scenario 4
[illegible]	[illegible]	1	1	1	1
[illegible]	[illegible]	2	4	3	3
[illegible]	[illegible]	3	2	6	6
[illegible]	[illegible]	4	3	9	2
[illegible]	[illegible]	5	6	4	5
[illegible]	[illegible]	6	5	13	7
[illegible]	[illegible]	7	14	2	4
[illegible]	[illegible]	8	19	4	8
[illegible]	[illegible]	9	8	13	9
[illegible]	[illegible]	10	13	8	28
[illegible]	[illegible]	11	7	12	48
[illegible]	[illegible]	12	9	24	10
[illegible]	[illegible]	13	15	14	29
[illegible]	[illegible]	14	16	17	24
[illegible]	[illegible]	15	30	7	17
[illegible]	[illegible]	16	29	11	13
[illegible]	[illegible]	17	12	33	12
[illegible]	[illegible]	18	20	22	18
[illegible]	[illegible]	19	11	38	10
[illegible]	[illegible]	20	10	20	58
[illegible]	[illegible]	21	18	16	46
[illegible]	[illegible]	22	37	10	16
[illegible]	[illegible]	23	24	23	36
[illegible]	[illegible]	24	32	18	40
[illegible]	[illegible]	25	22	43	21
[illegible]	[illegible]	26	26	31	43
[illegible]	[illegible]	27	25	42	26
[illegible]	[illegible]	28	27	37	22
[illegible]	[illegible]	29	33	31	35
[illegible]	[illegible]	30	35	26	33
[illegible]	[illegible]	31	34	25	57
[illegible]	[illegible]	32	33	65	15
[illegible]	[illegible]	32	47	13	23
[illegible]	[illegible]	34	28	50	30
[illegible]	[illegible]	34	34	21	75
[illegible]	[illegible]	35	21	85	14
[illegible]	[illegible]	36	17	71	44
[illegible]	[illegible]	38	42	41	45
[illegible]	[illegible]	39	41	54	32
[illegible]	[illegible]	40	31	62	46
[illegible]	[illegible]	40	49	29	53
[illegible]	[illegible]	42	51	26	63
[illegible]	[illegible]	43	39	66	19
[illegible]	[illegible]	43	46	45	55
[illegible]	[illegible]	45	42	29	100
[illegible]	[illegible]	45	48	36	58
[illegible]	[illegible]	47	43	76	20
[illegible]	[illegible]	47	30	40	27
[illegible]	[illegible]	48	44	27	114
[illegible]	[illegible]	50	56	36	61
[illegible]	[illegible]	50	57	35	75
[illegible]	[illegible]	52	48	41	80
[illegible]	[illegible]	52	53	53	34
[illegible]	[illegible]	54	37	96	50
[illegible]	[illegible]	55	52	72	51
[illegible]	[illegible]	56	55	87	41
[illegible]	[illegible]	56	56	56	39
[illegible]	[illegible]	57	54	84	37
[illegible]	[illegible]	59	59	81	30
[illegible]	[illegible]	59	31	62	54
[illegible]	[illegible]	61	39	91	78
[illegible]	[illegible]	61	38	33	87
[illegible]	[illegible]	62	53	51	119
[illegible]	[illegible]	63	31	54	74
[illegible]	[illegible]	65	76	61	42
[illegible]	[illegible]	66	35	76	67
[illegible]	[illegible]	67	75	50	77
[illegible]	[illegible]	68	70	54	111
[illegible]	[illegible]	69	57	81	118
[illegible]	[illegible]	69	83	72	38
[illegible]	[illegible]	70	73	95	52

(continued) Table 27: Ranking of Alaska's HUC-8 Watersheds Based on Scenarios 1-4

HUC 8	Watershed Name	Scenario 1	Scenario 2	Scenario 3	Scenario 4
19050401	Koyukuk River	72	82	46	115
19050202	Goodnews-Togiak Bay	73	72	84	74
19050202	Upper Kobuk River	74	79	79	71
19050202	Ugashik Bay	75	70	89	106
19050503	Nenana-St. Mathew Trib. Ob	75	81	78	72
14070204	Bear Island River	76	40	68	85
19040801	Lower Tanana River	77	92	77	90
19070401	North Fork Kuskokwim River	78	81	98	55
19040106	Upper Koyukuk River	79	99	52	91
19040904	Delta River	80	103	51	89
19060106	Lower Colville River	82	88	63	122
19040203	Skagway River	83	78	109	64
19080902	Rio	84	110	49	92
19090204	Gulkana River	85	64	113	113
19080303	Chandler-Anaktuvuk Rivers	86	0	103	114
19040204	Black River	87	96	97	61
19050204	Wood River	87	104	57	108
19090404	Nowitna River	88	91	106	49
19080203	Monte River	89	87	82	123
19050301	Upper Nushagak River	89	90	82	101
19060101	Upper Colville River	90	62	125	109
19080201	Wilin River	91	84	111	69
19050106	Nushagak Bay	92	106	60	110
19050202	Naknek River	93	76	105	105
19040904	Nenana-Tanana Bay	93	116	74	66
19080202	Wilki River	95	98	129	100
19090404	Melozitna-Hodzana Rivers	96	113	67	105
19080202	Kisaan River	99	89	116	68
19080902	Cornelius Bay	100	95	85	132
19080405	Unalaska-Pribilofs	101	108	65	130
19050203	Egegik Bay	102	91	94	115
19080803	Unalaska River	102	93	93	131
19080401	Upper Noatak River	103	85	124	90
19040903	Healy Lake	104	126	48	104
19040803	Beaufort Lagoon	105	77	133	116
19080401	Eagle to Circle	106	115	88	80
19020203	Prince William Sound	106	100	95	94
19080202	Northwest Coast	107	122	47	136
19050403	Yukon River	108	106	101	79
19080301	Middle Fork-North Fork Chandler Rivers	110	100	108	87
19040802	Upper Innoko River	111	105	115	65
19080201	Oak River	112	94	102	128
19010202	Sucker Bay	112	124	79	120
19010807	Outlet Portland Canal	113	95	126	116
19070404	Middle Fork Kuskokwim River	114	104	119	69
19080105	Skilak Lake	115	126	92	100
19090404	Nenana River	116	121	107	82
19080402	Middle Noatak River	117	101	132	108
19080106	Lower Chandler River	118	127	98	98
19080403	Utukok River	120	110	110	137
19010808	Headwaters Portland Canal	120	125	99	126
19080603	Akiak River	122	118	130	73
19080801	Kalgonik River	123	108	122	135
19040104	Koyukuk River	124	116	127	86
19090402	Gisasa River	125	122	128	83
19080602	South Fork Kuskokwim River	126	131	121	97
19080604	Kanektok River	127	124	136	84
19080501	Tanana River	128	117	118	139
19080130	Kachemak River	130	135	114	94
19040503	Kalskag River	131	130	133	93
19080102	Kenai River	132	125	116	140
19080205	Lower Inlet	132	131	132	130
19080103	Skilak River	133	132	134	96
19010500	Ly Stuck-Chatham Strait	133	133	134	133
19080604	Kasigluk River	134	129	137	99
19090407	Delta River	135	137	131	118
19080205	Harrison Bay	136	120	139	141
19090204	Forty Mile River	137	139	120	129
19080701	Kalima River	138	136	140	117
19080302	Indian River	139	141	126	134
19040201	Mi Creek River	140	138	138	137
19090203	Fifty Mile River	143	144	142	143
19090500	Kalubus Sound	144	143	144	144

Table 28: NFIP-Participating Communities by Ranked HUC-8 Watershed

NFIP PARTICIPATING COMMUNITY	FIPS	CID	HUC_8	Watershed Name	Rank
Kenai Peninsula Borough	02122	02122X	19020302	Upper Kenai Peninsula	1
Kenai, City of	02122	020128	19020302	Upper Kenai Peninsula	1
Municipality of Anchorage	02020	020005	19020302	Upper Kenai Peninsula	1
Soldotna, City of	02122	020014	19020302	Upper Kenai Peninsula	1
Aniak, City of	02050	020033	19050302	Kuskokwim Delta	2
Bethel, City of	02050	020104	19050302	Kuskokwim Delta	2
Kwethluk, City of	02050	020130	19050302	Kuskokwim Delta	2
Emmonak, City of	02270	020125	19040805	Yukon Delta	3
Cordova, City of	02261	020037	19020201	Eastern Prince William Sound	4
Kenai Peninsula Borough	02122	02122X	19020201	Eastern Prince William Sound	4
Matanuska-Susitna, Borough of	02170	02170X	19020201	Eastern Prince William Sound	4
Municipality of Anchorage	02020	020005	19020201	Eastern Prince William Sound	4
Valdez, City of	02261	020094	19020201	Eastern Prince William Sound	4
Homer, City of	02122	020107	19020301	Lower Kenai Peninsula	5
Kenai Peninsula Borough	02122	02122X	19020301	Lower Kenai Peninsula	5
Kenai Peninsula Borough	02122	02122X	19020202	Western Prince William Sound	6
Seward, City of	02122	020113	19020202	Western Prince William Sound	6
Matanuska-Susitna, Borough of	02170	02170X	19020401	Anchorage	7
Municipality of Anchorage	02020	020005	19020401	Anchorage	7
Matanuska-Susitna, Borough of	02170	02170X	19020402	Matanuska	8
Municipality of Anchorage	02020	020005	19020402	Matanuska	8
Municipality of Anchorage	02170	020005	19020402	Matanuska	8
Matanuska-Susitna, Borough of	02170	02170X	19020102	Middle Copper River	9
City & Borough of Juneau	02110	02110X	19010301	Lynn Canal	10
Haines Borough	02100	02100X	19010301	Lynn Canal	10
Ketchikan Gateway Borough	02130	02130X	19010102	Ketchikan	11
Ketchikan Gateway Borough	02130	02130X	19010102	Ketchikan	11
Cordova, City of	02261	020037	19020104	Lower Copper River	12
City & Borough of Sitka	02220	02220X	19010208	Baranof-Chichagof Islands	13
City & Borough of Sitka	02280	02195X	19010208	Baranof-Chichagof Islands	13
Hoonah, City of	02105	020049	19010208	Baranof-Chichagof Islands	13
Wrangell City & Borough	02280	02195X	19010208	Baranof-Chichagof Islands	13
Nome, City of	02180	020068	19050104	Nome	14
Fairbanks North Star Borough	02090	02090X	19040206	Chena River	15
Fairbanks North Star Borough	02090	02090X	19040207	Tanana Flats	16
Nenana, City of	02290	025010	19040207	Tanana Flats	16
Kenai Peninsula Borough	02122	02122X	19030405	Stony River	17
Lake and Peninsula Borough	02164	02164X	19030405	Stony River	17
McGrath, City of	02290	020128	19030405	Stony River	17
Kenai Peninsula Borough	02122	02122X	19020601	Redoubt-Trading Bays	19
Lake and Peninsula Borough	02164	02164X	19020601	Redoubt-Trading Bays	19
Matanuska-Susitna, Borough of	02122	02122X	19020601	Redoubt-Trading Bays	19
Matanuska-Susitna, Borough of	02170	02170X	19020601	Redoubt-Trading Bays	19
Haines Borough	02100	02100X	19010303	Chilkat-Skagway Rivers	20
Municipality of Skagway	02232	025011	19010308	Chilkat-Skagway Rivers	20
Petersburg, City of	02280	020074	19010202	Kuiu-Kupreanof-Mitkof-Etolin-Zarembo-Wrangell	21
Wrangell City & Borough	02280	020098	19010202	Kuiu-Kupreanof-Mitkof-Etolin-Zarembo-Wrangell	21
Wrangell City & Borough	02280	02195X	19010202	Kuiu-Kupreanof-Mitkof-Etolin-Zarembo-Wrangell	21
Wrangell City & Borough	02280	02275X	19010202	Kuiu-Kupreanof-Mitkof-Etolin-Zarembo-Wrangell	21
Wrangell City & Borough	02280	02280X	19010202	Kuiu-Kupreanof-Mitkof-Etolin-Zarembo-Wrangell	21
Matanuska-Susitna, Borough of	02170	02170X	19020203	Lower Susitna River	22
Kenai Peninsula Borough	02122	02122X	19020702	Shelikof Straight	25
Lake and Peninsula Borough	02164	02164X	19020702	Shelikof Straight	25
Kenai Peninsula Borough	02122	02122X	19050206	Lake Iliamna	26
Lake and Peninsula Borough	02164	02164X	19050206	Lake Iliamna	26
Kenai Peninsula Borough	02122	02122X	19050205	Lake Clark	27
Lake and Peninsula Borough	02164	02164X	19050205	Lake Clark	27
Northwest Arctic Borough	02188	02188X	19050201	Shishmaref	29
Shishmaref, City of	02180	020084	19050201	Shishmaref	29
Homer, City of	02122	020107	19020800	Cook Inlet	30
Kenai Peninsula Borough	02122	02122X	19020800	Cook Inlet	30
Kenai, City of	02122	020126	19020800	Cook Inlet	30
Matanuska-Susitna, Borough of	02170	02170X	19020800	Cook Inlet	30
Municipality of Anchorage	02020	020005	19020800	Cook Inlet	30
Fairbanks North Star Borough	02090	02090X	19040308	Tolovana River	32
Aniak, City of	02050	020033	19050301	Aniak	34
Kenai Peninsula Borough	02122	02122X	19020602	Tuxedni-Kamishak Bays	35
Lake and Peninsula Borough	02164	02164X	19020602	Tuxedni-Kamishak Bays	35
City & Borough of Juneau	02110	02110X	19010201	Mainland	36
Wrangell City & Borough	02280	020098	19010201	Mainland	36
Wrangell City & Borough	02280	02280X	19010201	Mainland	36
Northwest Arctic Borough	02188	02188X	19050103	Norton Bay	38
City & Borough of Juneau	02110	02110X	19010304	Taku River	40
Matanuska-Susitna, Borough of	02170	02170X	19040206	Nenana River	40
Nenana, City of	02290	025010	19040206	Nenana River	40
Kotzebue, City of	02188	020039	19050403	Lower Noatak River	42
Northwest Arctic Borough	02188	02188X	19050403	Lower Noatak River	42
Matanuska-Susitna, Borough of	02170	02170X	19020301	Upper Susitna River	43
Northwest Arctic Borough	02188	02188X	19050103	Inuruk Basin	43
Lake and Peninsula Borough	02164	02164X	19050101	Cold Bay	45
Northwest Arctic Borough	02188	02188X	19050301	Selawik Lake	45

(continued) Table 28: NFIP-Participating Communities by Ranked HUC-8 Watershed

NFIP PARTICIPATING COMMUNITY	FIPS	CID	HUC_8	Watershed Name	Rank
Fort Yukon, City of	02290	020045	19040403	Yukon Flats	47
Kenai Peninsula Borough	02122	02122X	19020504	Yentna River	47
Matanuska-Susitna, Borough of	02170	02170X	19020504	Yentna River	47
Galena, City of	02290	020124	19040705	Galena	50
Koyukuk, City of	02290	020127	19040705	Galena	50
Togiak, City of	02070	020090	19030305	Togiak	50
Fairbanks North Star Borough	02090	02090X	19040505	Salcha River	52
Kenai Peninsula Borough	02122	02122X	19030204	Naknek	52
Lake and Peninsula Borough	02164	02164X	19030204	Naknek	52
Lake and Peninsula Borough	02164	02164X	19030404	Holitna River	54
Matanuska-Susitna, Borough of	02170	02170X	19030407	South Fork Kuskokwim River	55
Matanuska-Susitna, Borough of	02170	02170X	19020503	Talkeetna River	56
Matanuska-Susitna, Borough of	02170	02170X	19020502	Chulitna River	57
Dillingham, City of	02070	020041	19030303	Lower Nushagak River	61
Ketchikan Gateway Borough	02130	02130X	19010101	Southeast Mainland	61
Ketchikan Gateway Borough	02280	02275X	19010101	Southeast Mainland	61
Lake and Peninsula Borough	02164	02164X	19030303	Lower Nushagak River	61
Wrangell City & Borough	02280	020098	19010101	Southeast Mainland	61
Wrangell City & Borough	02130	02130X	19010101	Southeast Mainland	61
Wrangell City & Borough	02280	02275X	19010101	Southeast Mainland	61
Wrangell City & Borough	02280	02280X	19010101	Southeast Mainland	61
City & Borough of Juneau	02110	02110X	19010204	Admiralty Island	63
City & Borough of Juneau	02110	02110X	19010204	Admiralty Island	63
Northwest Arctic Borough	02188	02188X	19040608	Koyukuk Flats	65
Northwest Arctic Borough	02188	02188X	19050303	Middle Kobuk River	67
Fairbanks North Star Borough	02090	02090X	19040402	Birch-Beaver Creeks	69
Lake and Peninsula Borough	02164	02164X	19030201	Port Heiden	69
Fort Yukon, City of	02290	020045	19040205	Porcupine Flats	70
Northwest Arctic Borough	02188	02188X	19050202	Goodhope-Spafarief Bay	73
Northwest Arctic Borough	02188	02188X	19050302	Upper Kobuk River	74
Lake and Peninsula Borough	02164	02164X	19030202	Ugashik Bay	75
Northwest Arctic Borough	02188	02188X	19050203	Buckland River	76
Nenana, City of	02290	025010	19040511	Lower Tanana River	77
Matanuska-Susitna, Borough of	02170	02170X	19030401	North Fork Kuskokwim River	78
Northwest Arctic Borough	02188	02188X	19050304	Lower Kobuk River	79
Delta Junction, City of	02240	020040	19040504	Delta River	80
Matanuska-Susitna, Borough of	02170	02170X	19040504	Delta River	80
Dillingham, City of	02070	020041	19030304	Wood River	87
Northwest Arctic Borough	02188	02188X	19060301	Upper Colville River	90
Dillingham, City of	02070	020041	19030306	Nushagak Bay	92
Lake and Peninsula Borough	02164	02164X	19030302	Mulchatna River	93
Northwest Arctic Borough	02188	02188X	19050404	Wulik-Kivalina Rivers	96
Northwest Arctic Borough	02188	02188X	19050405	Lisburne Peninsula	101
Lake and Peninsula Borough	02164	02164X	19030203	Egegik Bay	102
Northwest Arctic Borough	02188	02188X	19050401	Upper Noatak River	103
Delta Junction, City of	02240	020040	19040503	Healy Lake	104
Fairbanks North Star Borough	02090	02090X	19040503	Healy Lake	104
Fairbanks North Star Borough	02090	02090X	19040401	Eagle to Circle	105
Kenai Peninsula Borough	02122	02122X	19020203	Prince William Sound	106
McGrath, City of	02290	020128	19030403	Takotna River	108
Haines Borough	02100	02100X	19010302	Glacier Bay	112
Ketchikan Gateway Borough	02130	02130X	19010107	Outlet Portland Canal	113
Northwest Arctic Borough	02188	02188X	19050402	Middle Noatak River	117
Ketchikan Gateway Borough	02130	02130X	19010106	Headwaters Portland Canal	120
Northwest Arctic Borough	02188	02188X	19040603	Alatna River	122
Fort Yukon, City of	02290	020045	19040206	Grass River	124
Wrangell City & Borough	02280	02280X	19010205	Lower Iskut	132
Wrangell City & Borough	02280	020098	19010500	Icy Strait-Chatham Strait	133
Wrangell City & Borough	02280	02280X	19010500	Icy Strait-Chatham Strait	133
Northwest Arctic Borough	02188	02188X	19040606	Huslia River	134
Northwest Arctic Borough	02188	02188X	19050500	Kotzebue Sound	144

Mapping Recommendations

Each year the State of Alaska is asked to provide FEMA with an updated list of the top ten Alaskan watersheds recommended for study under FEMA's Risk MAP Program in the next fiscal year. ***The Alaska Prioritization and Future Studies Sequencing Decision Support System*** was developed to provide a defensible and fair prioritization of Alaskan watersheds. As noted in the previous chapter, this tool provides relative comparisons between watersheds based on a number of normalized factors in Alaska.

In 2015, the State of Alaska and FEMA began Risk MAP Discovery in the cities of Bethel, Kwethluk, Aniak and Emmonak. This year, FEMA and the State made the decision to initiate new Risk MAP studies every other year in order to devote more time to each study. The next group of watersheds to be prioritized will be for Risk Map Studies beginning in late 2016 and early 2017.

The table on the next two pages (pages 97 and 98) lists the top-ranked 50 watersheds based on the prioritization tool. Highlighted watersheds are those that have already been selected for Risk MAP studies, or are part of local jurisdictions which have recently undergone mapping studies. After removing these watersheds from the prioritization list, as well as those without significant populated areas or without communities that participate in the NFIP, the list in Table 28, below, shows the top 10 watersheds being recommended for Risk MAP studies in 2016-2017as well as the NFIP-participating communities located within these watersheds.

Table 29: Priority Watersheds for Risk MAP Studies in 2016-17

#	HUC-8 Watershed	NFIP Participating Jurisdiction
1	19010301 Lynn Canal	Haines Borough
2	19050104 Nome	City of Nome
3	19040506 Chena River	Fairbanks North Star Borough
4	19040507 Tanana Flats	Fairbanks North Star Borough, City of Nenana
5	19040507 Stony River	City of McGrath
6	19010303 Chilkat-Skagway Rivers	Haines Borough, Municipality of Skagway
7	19010202 Kuiu-Kupreanof-Mitkof-Etolin-Zarembo-Wrangell	City of Petersburg
8	19050201 Shishmaref	Northwest Arctic Borough, City of Shishmaref
9	19040508 Nenana River	City of Nenana
10	19050403 Lower Noatak River	City of Kotzebue

FEMA conducts a separate sequencing process for prioritizing Alaska's watersheds to be studied under Risk MAP. The State's priorities will be considered when a final decision is made about Risk MAP studies undertaken in 2015-2016

Table 30: NFIP Communities Located in the Fifty Highest-Ranked Watersheds

NFIP PARTICIPATING COMMUNITY	HUC_8	Watershed Name	Rank
Kenai Peninsula Borough	19020302	Upper Kenai Peninsula	1
Kenai, City of	19020302	Upper Kenai Peninsula	1
Municipality of Anchorage	19020302	Upper Kenai Peninsula	1
Soldotna, City of	19020302	Upper Kenai Peninsula	1
Aniak, City of	19030502	Kuskokwim Delta	2
Bethel, City of	19030502	Kuskokwim Delta	2
Kwethluk, City of	19030502	Kuskokwim Delta	2
Emmonak, City of	19040805	Yukon Delta	3
Cordova, City of	19020201	Eastern Prince William Sound	4
Kenai Peninsula Borough	19020201	Eastern Prince William Sound	4
Matanuska-Susitna, Borough of	19020201	Eastern Prince William Sound	4
Municipality of Anchorage	19020201	Eastern Prince William Sound	4
Valdez, City of	19020201	Eastern Prince William Sound	4
Homer, City of	19020301	Lower Kenai Peninsula	5
Kenai Peninsula Borough	19020301	Lower Kenai Peninsula	5
Kenai Peninsula Borough	19020202	Western Prince William Sound	6
Seward, City of	19020202	Western Prince William Sound	6
Matanuska-Susitna, Borough of	19020401	Anchorage	7
Municipality of Anchorage	19020401	Anchorage	7
Matanuska-Susitna, Borough of	19020402	Matanuska	8
Municipality of Anchorage	19020402	Matanuska	8
Municipality of Anchorage	19020402	Matanuska	8
Matanuska-Susitna, Borough of	19020102	Middle Copper River	9
City & Borough of Juneau	19010301	Lynn Canal	10
Haines Borough	19010301	Lynn Canal	10
Ketchikan Gateway Borough	19010102	Ketchikan	11
Ketchikan Gateway Borough	19010102	Ketchikan	11
Cordova, City of	19020104	Lower Copper River	12
City & Borough of Sitka	19010203	Baranof-Chichagof Islands	13
City & Borough of Sitka	19010203	Baranof-Chichagof Islands	13
Hoonah, City of	19010203	Baranof-Chichagof Islands	13
Wrangell City & Borough	19010203	Baranof-Chichagof Islands	13
Nome, City of	19050104	Nome	14
Fairbanks North Star Borough	19040506	Chena River	15
Fairbanks North Star Borough	19040507	Tanana Flats	16
Nenana, City of	19040507	Tanana Flats	16
Kenai Peninsula Borough	19030405	Stony River	17
Lake and Peninsula Borough	19030405	Stony River	17
McGrath, City of	19030405	Stony River	17
Kenai Peninsula Borough	19020601	Redoubt-Trading Bays	19
Lake and Peninsula Borough	19020601	Redoubt-Trading Bays	19
Matanuska-Susitna, Borough of	19020601	Redoubt-Trading Bays	19
Matanuska-Susitna, Borough of	19020601	Redoubt-Trading Bays	19

* Communities high-lighted in yellow have already been selected for Risk MAP Studies. Communities high-lighted in peach/tan are suspended communities which don't participate in the NFIP.

Table 30, continued: NFIP Communities Located in the Fifty Highest-Ranked Watersheds

NFIP PARTICIPATING COMMUNITY	HUC_8	Watershed Name	Rank
Haines Borough	19010303	Chilkat-Skagway Rivers	20
Municipality of Skagway	19010303	Chilkat-Skagway Rivers	20
Petersburg, City of	19010202	Kuiu-Kupreanof-Mitkof-Etolin-Zarembo-Wrangell	21
Wrangell City & Borough	19010202	Kuiu-Kupreanof-Mitkof-Etolin-Zarembo-Wrangell	21
Wrangell City & Borough	19010202	Kuiu-Kupreanof-Mitkof-Etolin-Zarembo-Wrangell	21
Wrangell City & Borough	19010202	Kuiu-Kupreanof-Mitkof-Etolin-Zarembo-Wrangell	21
Wrangell City & Borough	19010202	Kuiu-Kupreanof-Mitkof-Etolin-Zarembo-Wrangell	21
Matanuska-Susitna, Borough of	19020505	Lower Susitna River	22
Kenai Peninsula Borough	19020702	Shelikof Straight	25
Lake and Peninsula Borough	19020702	Shelikof Straight	25
Kenai Peninsula Borough	19030206	Lake Iliamna	26
Lake and Peninsula Borough	19030206	Lake Iliamna	26
Kenai Peninsula Borough	19030205	Lake Clark	27
Lake and Peninsula Borough	19030205	Lake Clark	27
Northwest Arctic Borough	19050201	Shishmaref	29
Shishmaref, City of	19050201	Shishmaref	29
Homer, City of	19020800	Cook Inlet	30
Kenai Peninsula Borough	19020800	Cook Inlet	30
Kenai, City of	19020800	Cook Inlet	30
Matanuska-Susitna, Borough of	19020800	Cook Inlet	30
Municipality of Anchorage	19020800	Cook Inlet	30
Fairbanks North Star Borough	19040509	Tolovana River	32
Aniak, City of	19030501	Aniak	34
Kenai Peninsula Borough	19020602	Tuxdeni-Kamishak Bays	35
Lake and Peninsula Borough	19020602	Tuxdeni-Kamishak Bays	35
City & Borough of Juneau	19010201	Mainland	36
Wrangell City & Borough	19010201	Mainland	36
Wrangell City & Borough	19010201	Mainland	36
Northwest Arctic Borough	19050103	Norton Bay	38
City & Borough of Juneau	19010304	Taku River	40
Matanuska-Susitna, Borough of	19040508	Nenana River	40
Nenana, City of	19040508	Nenana River	40
Kotzebue, City of	19050403	Lower Noatak River	42
Northwest Arctic Borough	19050403	Lower Noatak River	42
Matanuska-Susitna, Borough of	19020501	Upper Susitna River	43
Northwest Arctic Borough	19050105	Imuruk Basin	43
Lake and Peninsula Borough	19030101	Cold Bay	45
Northwest Arctic Borough	19050301	Selawik Lake	45
Fort Yukon, City of	19040403	Yukon Flats	47
Kenai Peninsula Borough	19020504	Yentna River	47
Matanuska-Susitna, Borough of	19020504	Yentna River	47
Galena, City of	19040705	Galena	50
Koyukuk, City of	19040705	Galena	50
Togiak, City of	19030305	Togiak	50

* Communities high-lighted in yellow have already been selected for Risk MAP Studies. Communities high-lighted in peach/tan are suspended communities which don't participate in the NFIP.

Alaska Risk MAP Goals For the Coming Year

Each year, goals are identified to ensure Alaska's Risk MAP Program fulfills its mission to deliver quality hazard data to Alaska's local governments in order to increase public awareness and lead to action that reduces risk to life and property. As the State Risk MAP coordinating agency, DCRA will accomplish the work program from October 1, 2015 through September 30, 2016 by implementing tasks to achieve the following goals:

- Enable alignment of State Vision and Goals with FEMA's Goals through integration of sound planning;
- Support Risk MAP product development and delivery;
- Encourage risk reduction action and hazard mitigation from the local level up;
- Coordinate Risk MAP activities with floodplain management and emergency management activities conducted by the state, FEMA Region X, and other federal agencies;
- Keep abreast of proposed legislation and changes in law, regulations, building codes and other policies conducted by the State, FEMA Region X, and FEMA's other mapping partners.

These goals will guide DCRA's implementation of the Alaska Risk MAP Program over the next year, outlined as follows:

PROGRAM MANAGEMENT STATEMENT OF WORK

State and Local Business Plans and/or Updates

Scope: State and Local Business Plans and/or updates must be submitted in order for a partner to receive funding for Program Management in FY14. Plans must document the capabilities and accomplishments of the partner; explain the CTP's vision for implementing or participating in Risk MAP, such as describing how the partner's activities advance the vision, goals and objectives of Risk MAP (including encouraging communities to take action to mitigate risk); include updates from previous years' activities (if applicable); and identify flood hazard mapping needs and give recommendations to FEMA regarding future Flood Risk Projects within the state or local jurisdiction.

CTPs who also receive an award for the Community Engagement and Risk Communication (CERC) SOW may combine the Business Plan requirements of the PM and CERC awards into a single deliverable, with approval of the FEMA Regional Project Officer. The combined Business Plan must include all required elements of the PM Business Plan and the CERC Business Plan.

- Gather information regarding new mapping and risk assessment needs:

- ◊ DCRA will continue to coordinate with State agencies and local communities to refine information regarding new mapping and risk assessment needs.

- Update Business Plan to reflect new mapping and risk assessment needs:
  - ◊ DCRA will enhance and continue the development of the State of Alaska Risk MAP Strategy
  - ◊ DCRA will analyze information gathered and use FEMA's guidance for prioritization of future study needs
  - ◊ DCRA will share draft documents with other State Agencies including Alaska Division of Homeland Security and Emergency Management for review, feedback, and integration with the State Hazard Mitigation Plan prior to finalizing the document.
  - ◊ DCRA will publish updates to study needs in the FY16 Alaska State Business Plan Document and Geographic Information System (GIS) Data
  - ◊ DCRA will strive to meet FEMA Region X Priorities for Risk MAP by identifying opportunities to:
    - Meet regional metrics related to identifying and advancing risk reduction and mitigation actions in Risk MAP communities.
    - Collect field survey and Light Detection and Ranging (LiDAR) data cost-effectively for future Flood Mapping production and assessing and prioritizing the Region's un-modernized inventory.
    - Meet regional metrics related to advancing New Validated Updated Engineering (NVUE).
    - Promote multi-benefit protection in relation to Risk MAP objectives.
    - Initiate and coordinate regional non-accredited levee projects.

Standards: All State and Local Business Plans and/or Updates work shall be performed in accordance with the standards specified in Section 4 - Standards.

Deliverables: The CTP shall deliver the following to the FEMA Regional Project Officer: Alaska Mapping Business Plan, 2016 Update.

Global Program Management

Scope: Program Management is the active process of managing multiple related projects which need to meet or exceed pre-defined performance metrics. Specific metrics are defined on a region-by-region basis and it is recommended to include and/or reference specific relevant metrics as appropriate in this document. Efforts across a program should be aligned and integrated toward the accomplishment of Risk MAP goals.

Program Management activities will typically occur in the areas of integration, scope, schedule, cost, quality, human resources (staffing, training, resource enablement, etc.), communication, risk and/or

procurement. Some efforts may extend beyond the scope of work defined in the Statement of Work or specific project Mapping Activity Statement(s).

Coordinate Risk Map Activities with Floodplain Management Activities conducted by the State, FEMA Region X, and FEMA'S Mapping Partners. The CTP will work with the FEMA Regional Office during the initiation of this activity to determine a Program Management Plan for implementation:

Partnership among agencies is necessary for successful implementation of the Risk MAP Program. It enables more efficient data acquisition, information sharing, and enhanced project development and delivery. DCRA will consult with partner agencies and work with communities to encourage use of sound science regarding risk in order to enhance the public's understanding of vulnerability and to support risk-based mitigation planning. In order to foster an interagency environment of collaboration and innovation, DCRA will:

- Organize and attend monthly Coordination Calls to ensure unified messaging
- Coordinate with partner agencies and stakeholders to identify future LiDAR and Risk MAP study needs and communicate those findings to FEMA
- Whenever possible, submit Risk MAP newsletter articles to advertise and promote opportunities for potential Risk MAP stakeholder and Subject Matter Expert participation Risk MAP activities
- Inform FEMA of opportunities for collaboration with other potential stakeholders to promote incorporation of sound science into the Alaska State Risk MAP Program. DCRA's role is critical to promoting development of quality flood hazard maps and general risk reduction across state agencies.
- Whenever possible, keep up to date with the most current information on risk assessment, community resilience, mitigation planning and floodplain mapping by taking advantage of training opportunities provided through the following conferences:
  - FEMA Region X Mitigation Summit
  - Association of State Floodplain Managers Annual National Conference
  - Northwest Regional Floodplain Management Association Annual Conference
  - American Planning Association National Planning Conference
  - Alaska Chapter of the American Planning Association Alaska Planning Conference
  - Alaska Forum on the Environment
  - Other relevant venues as they become available
- Actively participate in the Alaska Silver Jackets Team

- Attend GIS and HAZUS training and participate in the Northwest Hazus User Group (NWHUG) Calls when available.

Standards: All Global Program Management Activities work shall be performed in accordance with the standards specified in Section 4 – Standards.

Deliverable: The CTP shall deliver the following to the FEMA Regional Project Officer:
- Program Management Plan (included in State of Alaska Risk MAP Strategy)

Global Outreach for Mapping

Scope: The outreach project or activities for a Program Management SOW can best be understood as a process that enhances the understanding of the overall National Flood Insurance Program (NFIP) flood mapping program and the flood risk. This task does not include the outreach activities for a specific mapping project that begins during the project Discovery phase and continues through the map production and post preliminary phases.

The overarching goal for outreach is to create a climate of understanding and ownership of the mapping process at the state and local levels. Well-planned outreach activities can reduce political stress, confrontation in the media, and public controversy, which can arise from lack of information, misunderstanding, or misinformation. These outreach activities also can assist FEMA and other members of the Project Management Team (PMT) in responding to congressional inquiries. The CTP plans to continue outreach activities to fulfill its strategy to educate communities on the necessary standards and benefits of developing better flood risk information.

The CTP will work with the Regional Office during the initiation of this activity to determine or understand the Outreach Plan. The Regional Office will have access to many outreach tools that have been developed for this process that can be utilized or customized. All communication with local governments will be done in accordance with 44 CFR Part 66.

The Mapping Partner shall notify FEMA and all applicable parties of all meetings with community officials at least two weeks prior to the meeting (with as much notice as possible). FEMA and/or its contractor may or may not attend the community meetings.

Standards: All Outreach activities shall be performed in accordance with the standards specified in Section 4 - Standards.

Deliverables: The CTP shall deliver the following to the FEMA Regional Project Officer:

- DCRA will incorporate outreach activities into the 2016 update of the Alaska Mapping Business Plan;
- Updates to the Alaska Risk MAP website, including:
  - Discovery Agendas, Meeting Notes and Presentations
  - Discovery Reports
  - Draft Work Maps
  - Preliminary Maps
  - Quarterly Reports
  - Risk MAP products
  - Risk Reports
- Assist in the delivery of resources and services available to communities to increase risk awareness and promote acceptance of mitigation actions; and
- Notify FEMA and all applicable parties of all meetings with community officials at least two weeks prior to the meeting (with as much notice as possible). FEMA and/or its contractor may or may not attend the community meetings.

Minimal Map Printing

Scope: Print copies of maps for individuals within the CTP's jurisdiction. Funding for this activity must not be covered under another FEMA grant program and may not exceed $5,000.

Standards: All Minimal Map Printing activities work shall be performed in accordance with the standards specified in Section 4 - Standards.

Deliverables: The CTP shall deliver the following to the FEMA Regional Project Officer:

- Quarterly report detailing the map printing activities, including recipient community/individual, panel number, number of copies and total associated cost.

Coordinated Needs Management Strategy (CNMS)

Scope: Update CNMS post-Discovery for each Risk MAP Community and share these updates with the CNMS POC.

Standards: All work shall be performed in accordance with the standards specified in the CNMS User's Guide.

Deliverables: The CTP shall deliver the following to the FEMA Regional Project Officer in accordance with the schedule outlined in Section 5 – Schedule.

- Updated CNMS database with dates updated and clean line work reflecting changes to validation that has occurred as a result of evaluation;

The CTP shall maintain an archive of all data submitted for not less than three years.

COMMUNITY ENGAGEMENT AND RISK COMMUNICATION STATEMENT OF WORK

STRATEGIC PLANNING FOR COMMUNITY ENGAGEMENT

Scope: The CTP will strategically prepare for engagement with watershed communities throughout a project's lifecycle. Goals of this engagement are to help create understanding and ownership of flood risk at State and local levels and to strengthen and encourage communities to take responsibility for progressing risk reduction actions that will result in a more resilient community.

Community action cannot be purchased; however, it can be influenced and advanced by proper project and communications planning throughout the Risk MAP process. Strategic communications planning can be assisted by a variety of tools and activities. The following potential activities included in this task are listed below:

Integration Planning - Activities include conducting regular, cross-Mitigation meeting(s) for the watershed and/or project area (with emphasis on priority communities) to refresh community profile(s), and develop plans for advancing relationships and mitigation action.

Action Strategy - Support the development of the Regional approach for helping communities to identify and advance mitigation strategies. Supporting activities to identify and advance actions may include: evaluation of strategies in local plans and initiatives; primary and secondary research; stakeholder engagement; and facilitated planning processes.

Community Prioritization - Activities include prioritizing communities within a watershed based on action potential and contribution to the action target to define the level of personalized engagements communities receive.

Watershed & Community Assessment - Activities include assessing a watershed and high priority communities to understand what is important to them, their mitigation priorities, and their existing relationships with FEMA.

Relationship Management and Action Plan - Activities include evaluating, updating, and executing on the relationship plan and mitigation action plan(s).

Communication and Outreach Strategy - Support the development and implementation of a Communication and Outreach Strategy for outreach activities including various ad-hoc or regionally defined engagement. Examples could include expanded kick off meetings, stakeholder coordination, engagement or communications planning, and specialized training. Improve and enhance the State post-resilience strategy for risk reduction. Continued participation with the Silver Jackets Team in Alaska.

Additionally, outreach activities for mapping will be performed and can best be understood as a process that enhances the understanding of the overall National Flood Insurance Program (NFIP) flood mapping program and the flood risk. This task does not include the outreach activities for a specific mapping project that begins during the project Discovery phase and continues through the map production and post preliminary phases.

The overarching goal for outreach is to create a climate of understanding and ownership of the mapping process at the State and local levels. Well-planned outreach activities can reduce political stress, confrontation in the media, and public controversy, which can arise from lack of information, misunderstanding, or misinformation. These outreach activities also can assist FEMA and other members of the Project Management Team (PMT) in responding to congressional inquiries. The CTP plans to continue Outreach activities to fulfill its strategy to educate communities on the necessary standards and benefits of developing better flood risk information.

The CTP will market and deliver resources and services that may be available to communities to increase risk awareness and promote acceptance of mitigation actions. This does not include the outreach activities for a specific mapping project that begins during Discovery and continues through the map production and post preliminary phases (when funded).

The following potential activities included in this task are listed below:

Product Development & Dissemination - Develop and disseminate messages and products to support the Communication and Outreach Strategy (developed under the Strategic Planning Task), including social media platforms, websites, fact sheets, newsletters, and press releases.

Outreach Campaign Implementation – Support implementation of outreach campaigns in communities as identified in the Communications and Outreach Strategy, i.e. the High Water Mark Campaign and Flood Safe.

Other - Other activities as negotiated with the Region.

Standards: All work shall be performed in accordance with the standards specified in Section 4 - Standards.

Deliverables: The CTP shall deliver the following to the FEMA Regional Project Officer:

- Integrated and strategic plan for advancing relationships and mitigation action, coordinated with the State Hazard Mitigation Officer and the State Mitigation Planner
- New or updated community profiles
- Update to CTP's website as needed

Meetings and Process Facilitation

Scope: The CTP will hold meetings and facilitate decision making processes. The objectives of this task include coordination and follow through for risk awareness, increased regulatory product adoption and acceptance, and mitigation throughout the Flood Risk Project lifecycle. Meeting activities include planning, presenting, facilitating discussions and completing any associated follow up. The following potential activities included in this task are listed below:
Process Facilitation - Activities include support for implementation of the strategic planning efforts, which could include: identifying and supporting key community priorities and key influencers; support community identification of mitigation opportunities; gap analysis of community requirements for mitigation implementation; ongoing relationship management; monitoring, evaluation and update; and developing and disseminating messages and products to support the Risk MAP process, including fact sheets, newsletters, and press releases.

Discovery Meeting – Anticipated meetings include:

- City of Aniak Discovery Meeting
- City of Bethel Discovery Meeting
- City of Kwethluk Meeting

New Community (TBD) Discovery Meeting
Consultation Coordination Officer (CCO) Meeting - Activities may include planning, presenting and facilitating discussions with community officials for awareness and acceptance of regulatory products. The purpose of the meeting will be to review data inputs to a flood study, preview changes to preliminary FIRM data and maps, discuss newly identified flood risk and community actions to reduce risk, and provide information about the appeals period, map adoption, and insurance impacts. Anticipated meetings include:

- City of Valdez CCO/Public Meeting
- Matanuska-Susitna Borough CCO/Public Meeting
- City and Borough of Sitka CCO/Public Meeting

Flood Engineering Review Meeting - Activities may include planning, presenting, and facilitating discussions of data inputs and engineering models used for flood studies with community officials. In addition, draft work maps showing initial study results will be presented during the meeting. The meeting may also include review of mitigation actions and any non-regulatory products if developed during the project. Anticipated meetings include:

- Ketchikan Gateway Borough Flood Risk Review Meeting
- City and Borough of Juneau Flood Risk Review Meeting
- City and Borough of Sitka Flood Risk Review Meeting

Resilience Meeting – Activities may include the planning, presenting and facilitation of community discussions related to mitigation plan status, community risks and hazards, local mitigation action opportunities and best mitigation practices.

Anticipated meetings include:

- City of Cordova Resilience Meeting
- Kenai Peninsula Borough Resilience Meeting

The Mapping Partner shall notify FEMA and all applicable parties of all meetings with community officials at least two weeks prior to the meeting (with as much notice as possible). FEMA and/or its contractor may or may not attend the community meetings.

Standards: All work shall be performed in accordance with the standards specified in Section 4 - Standards.

Deliverables: The CTP shall deliver the following to the FEMA Regional Project Officer:
Meeting Minutes, Attendees List, and Actions discussed/identified (provided to Region within4 weeks of the meeting)

Mitigation Support (Action Advancement and Tracking)

Scope: The CTP will leverage Risk MAP data, decision support analyses, products and/or processes to support communities to advance mitigation actions. The following potential activities included in this task are listed below:

Action Identified - Support for communities to identify mitigation opportunities and/or select amongst alternatives through the provision of data and/or analysis. Data is considered new data or aggregation of existing data delivered and disseminated in formats readily consumed by the end user. Analysis (i.e.: risk assessments; social vulnerability analysis; triple bottom line analysis; and feasibility assessments) may be performed to help identify solutions to identified problems and/or develop requirements for project solutions.

Action Advanced - Support for communities to advance mitigation opportunities including scoping/design; budgeting; obtaining funding; project planning; technical support for zoning and ordinance development;

and outreach strategies for project support. *Funds cannot be used to update all or part of a Hazard Mitigation Plan.*

Both Action Identified and Action Advanced - Activities to support communities that combine aspects of action identified with action advanced.

- Engage and provide technical assistance to communities on projects and strategies to increase community resilience through the U.S. Department of Housing and Urban Development (HUD) National Disaster Resilience Competition (NDRC).
- Coordinate with other State and federal agencies on projects and strategies to increase community resilience through the HUD NDRC, including serving on the State Interagency Working Group for the NDRC.

Evaluation and Valuation - Support provided to the community to evaluate and demonstrate the value of the mitigation investment, including the calculation of economic, environmental and/or social benefits or the losses avoided from natural hazard events.

Other - Other activities as negotiated with the Region.

The CTP shall work in close coordination with Emergency Management throughout the lifecycle of a Risk MAP project to collect and quantify Actions Identified and Actions Advanced as part of a project specific MAS. Additionally, Actions will be collected up to 2 years after the close out of a Risk MAP project. This activity is used to provide for the coordinated effort with Emergency Management for communicating with communities outside of the lifecycle of the Risk MAP project extending for 2 years beyond completion of the project, for all watersheds that have these 2 years beyond project lifecycle fall within the Period of Performance of this MAS.

Standards: All work shall be performed in accordance with the standards specified in Section 4 - Standards.

Deliverables: The CTP shall deliver the following to the FEMA Regional Project Officer:

- Updates to Action Tracker with new Actions Identified or Advanced through these coordinations.

Communication and Outreach to Communities

Scope: DCRA will support on-going project efforts that foster working relationships between federal, state, and local governments with private and public interests in order to reduce the frequency of natural disasters where a community's interaction with a natural hazard may be minimized or averted. These efforts are intended to develop actionable measures within Flood Risk Project footprints in order to increase the:

- Understanding of natural hazard risk within a community,
- Support local efforts to reduce natural hazard risk within a community or watershed area, and

- Effectiveness of meetings and engagement opportunities with communities throughout the Risk MAP lifecycle.

The following potential activities included in this task are listed below:

- Community Prioritization: DCRA will prioritize communities within a watershed based on action potential and contribution to the action target to define the level of personalized engagements communities receive.
- Watershed & Community Assessment: DCRA will assist with assessing a watershed and high priority communities to understand what is important to them, their mitigation priorities, and their existing relationships with FEMA.
- Introductory and Pre-Call Screenings: For each of the top influencers, DCRA will conduct a pre-Discovery interview to ensure understanding of FEMA's involvement with the community, as well as more information on what's important to the influencer.

Standards: All activities shall be performed in accordance with the standards specified in Section 4 - Standards. All communication with local governments will be done in accordance with 44 CFR Part 66.

Deliverables: The CTP shall deliver the following to the FEMA Regional Project Officer:

- A quarterly report detailing outreach and coordination activities, with any backup or supplemental information used
- Backup or supplemental information used in writing this report
- Update the CTP's Risk MAP website

Training to State and Local Officials and Community Capability Development

Scope: Develop and provide technical training to state and local officials throughout the course of a flood risk project. Training can be provided at any time during the flood risk project, and it may be desired to include a series of training activities over the course of a flood risk project.

DCRA will support community efforts to raise awareness of risk; mitigation planning; risk assessment; as well as assessing, prioritizing, developing and implementing mitigation strategies. Activities may include: planning, developing and delivering the training or direct support for community capability development.

As necessary, DCRA will develop and provide technical training to State and Local Officials throughout the course of a flood risk project. Training can be provided at any time during the RiskMAP project, and it may be desired to include a series of training activities over the course of a project.

The CTP must ensure, and must provide documentation when requested by FEMA, that activities funded through this SOW do not replace activities funded under other Federal grant programs, such as Hazard

Mitigation Planning or Floodplain Management grant programs. The following potential activities included in this task are listed below:

Risk MAP data availability and tools- Support building community capability to use and understand the regulatory and non-regulatory components and tools of a Risk MAP project

Community Capability Development – Support building community capability to sponsor and implement mitigation actions through activities such as: capability assessment, gap analysis, as well as process, change and project management.

Building Science - Support States, Tribes and local communities in the understanding of construction issues and opportunities in the identified natural hazard and risk areas.

Community Planning - Support States, Tribes and local communities in the consideration of natural hazards in all relevant areas of community planning, i.e. comprehensive plans, capital improvement plans, etc.

Grant Application Development - Support States, Tribes and local jurisdictions in the development of scopes of work, schedules and budgets for a successful mitigation activity grant application. Funds may not be used to develop, submit or execute a grant proposal on behalf of a State, Tribe or local jurisdiction.

Risk Assessment - Support States, Tribes and local communities in the assessment of relative risk for decision support, including HAZUS or other methods.

Other - Other activities as negotiated with the Region.

Sponsor funding will be provided to assure other State agency involvement with Risk MAP.

Training can be provided at any time during a flood risk project, and it may be desired to include a series of training activities over the course of a flood risk project. The CTP will coordinate and/or administer training for communities and/or individual groups regarding any desired training. The CTP will:

- determine target audience (name of community and/or individual groups, such as CEOs, engineers, GIS employees, etc.)
- advertise to, and confirm, training participants.
- determine training facility.
- follow-up with participants on unresolved issues.

Standards: All activities shall be performed in accordance with the standards specified in Section 4 - Standards. CTPs must coordinate with the Regional Project Officer to ensure that any training developed or delivered also complies with Regional standards.

Deliverables: The CTP shall deliver the following to the FEMA Regional Project Officer:

- copies of draft and final training materials;

- a list of training instructors;
- a list of all participants and completed course evaluations (such as pre- and post-knowledge surveys) after each training course;

The CTP will coordinate and/or administer training for communities within watersheds currently being studied regarding Community Capability Development, Community Planning, Grant Application Development, and Risk Assessment.

Mitigation Planning Technical Assistance

Scope: Develop and disseminate products and materials to support States, Tribes and local jurisdictions to develop, evaluate, update and implement their mitigation plans and strategies. Technical Assistance provided through Risk MAP should focus on building a community's capability to plan for and reduce risk. Technical Assistance should encourage hazard mitigation plan implementation and advance community hazard mitigation actions through the Mitigation Planning Process in the form of administration, technical assistance for specific planning requirements, as well as resources and tools for improved planning. The following steps are emphasized:

- Incorporating new flood hazard and risk information;
- Updating and refining mitigation strategies, especially as related to new flood hazard/risk information;
- Training mitigation planning teams; and
- Incorporating mitigation into existing community plans, programs, and policies.
- Develop and disseminate products and materials to support communities to develop, evaluate, update and implement their mitigation plans and strategies.
- Work with communities to assess and recommend appropriate level and detail of Risk Assessment to meet community needs and respond to community requests for technical assistance
- Focus on building a community's capability to plan for and reduce risk.
- Encourage hazard mitigation plan implementation and advance community hazard mitigation actions through Risk MAP projects and the Mitigation Planning Process in the form of administration, technical assistance for specific planning requirements, as well as resources and tools for improved planning. The following steps are emphasized:
  - ◊ Incorporating new flood hazard and risk information;
  - ◊ Updating and refining mitigation strategies, especially as related to new hazard/risk information;
  - ◊ Training mitigation planning teams; and
  - ◊ Incorporating mitigation into existing community plans, programs, and policies
  - ◊ Identifying and promoting action.
- Assist with long-term recovery efforts for Alaska communities included in federal disaster declarations.
- Serve as a state partner for the National Disaster Recovery Framework and the Recovery Support Function for Community Planning and Capacity Building.

- Engage and provide technical assistance to communities on projects and strategies to increase community resilience through the HUD NDRC.
- Coordinate with other State and federal agencies on projects and strategies to increase community resilience through the HUD NDRC, including serving on the State Interagency Working Group for the NDRC.
- Direct requests specifically related to the National Flood Insurance Program (NFIP) to DCRA's NFIP coordinator.
- Notify FEMA of potential risks or issues raised by communities throughout the project life cycle.
- Make contact with communities on a regular basis to help identify success stories or issues to be addressed.
- Take advantage of local venues, such as the Alaska Planning Conference and the Alaska Forum on the Environment, to provide education and outreach on the Risk MAP Program, its benefits to Alaskan communities, and how Risk MAP information and products can be integrated into local hazard mitigation plans, land use plans, building codes, and hazard mitigation efforts.
- Provide timely, consistent and valid communication to communities and stakeholders to establish and maintain credibility and build on existing relationships
- Facilitate a unified presence and messaging at community and public meetings and conference calls
- Whenever possible, implement an innovative approach to maintain enduring communication with Alaska communities.
- Maintain a State of Alaska based website that provides information regarding ongoing Risk MAP study status, training opportunities and other resources to communities and partners.
- Whenever possible, update literature to support risk-based mitigation planning and assessment in Alaska communities, such as DCRA's FEMA-funded Understanding and Evaluating Erosion Problems.

This task may be used to provide state and local officials with technical assistance for achieving mitigation actions. This task may be used for the creation and dissemination of training and technical assistance for achieving mitigation actions and cannot be used to fund the creation or update of a Hazard Mitigation Plan. This task cannot fund an activity that is already funded through another Federal grant (including the Program Management SOW) and should not duplicate assistance available to any community engaged in a Risk MAP project or a Hazard Mitigation Assistance (HMA) planning or project grant.

Training can be provided at any time during the flood risk project, and it may be desired to include a series of training activities over the course of a flood risk project.

Standards: All Technical Assistance activities shall be performed in accordance with the standards specified in Section 4 - Standards. Coordinate with Regional Project Officer to ensure that technical assistance also complies with Regional standards. Additional information may be available in FEMA's guidance document *Risk MAP Guidance for Incorporating Mitigation Planning Technical Assistance and Training into Flood Risk Projects*.

Deliverables: The CTP shall deliver the following to the FEMA Regional Project Officer:

- Copies of all technical data provided to State, Tribal and local communities.
- A report detailing the technical assistance provided, including date(s) of technical assistance, type of assistance and State, Tribal or local community stakeholders supported.

REFERENCES

Childers, V.A., D.R. Roman, D.A. Smith, and T.M. Diehl. *GRAV-D: NGS Gravity for the Re-definition of the American Vertical Datum Project.* Proc. of First Annual Workshop on Monitoring North American Geoid Change, Boulder, Colorado. U.S. National Geodetic Survey. www.ngs.noaa.gov/grav-d/2009Workshop/Presentations/Childers_US_NGS_GRAV-D.ppt

DCRA. 2009. *Rural Population Report: The Trends are Changing.* State of Alaska Department of Commerce, Community, and Economic Development, Division of Community and Regional Affairs (DCRA): Anchorage, AK.

DCRA. 2012. *Alaska Planning Commission Handbook.* State of Alaska Department of Commerce, Community, and Economic Development, Division of Community and Regional Affairs (DCRA): Anchorage, Alaska.

Denali Commission. 2007. *Working Together for a Better Alaska: Annual Report 2007*. Denali Commission, an Independent Federal Government Agency.

DHSEM. 2007. *Alaska: All-Hazard Risk Mitigation Plan*. State of Alaska Department of Military and Veteran Affairs, Division of Homeland Security and Emergency Management (DHSEM).

FEMA. 2007. FEMA's *Flood Map Modernization – Preparing for FY09 and Beyond: Integrated Flood Data Update, Risk Assessment, and Mitigation Planning* (Draft Concept Paper). United States Department of Homeland Security, Federal Emergency Management Agency (FEMA): Washington, DC.

FEMA. 2008. FEMA's *Risk MAP Strategy – Integrating Mapping, Assessment, and Mitigation Planning* (Draft Strategy). United States Department of Homeland Security, Federal Emergency Management Agency (FEMA): Washington, DC.

FEMA. 2009. Risk MAP FY09 *Flood Mapping Production Plan*. United States Department of Homeland Security, Federal Emergency Management Agency (FEMA): Washington, DC.

FEMA. 2009. *Risk MAPping, Assessment, and Planning (Risk MAP) Multi-Year Plan: Fiscal Years 2010 – 2014* (Fiscal Year 2009 Report to Congress). United States Department of Homeland Security, Federal Emergency Management Agency (FEMA): Washington, DC.

FEMA. 2009. Risk Mapping, Assessment, and Planning (Risk MAP): Fiscal Year 2009 Flood Mapping Production Plan (Version 1.0). United States Department of Homeland Security, Federal Emergency Management Agency (FEMA): Washington, DC.

FEMA. 2011. Discovery Report, FEMA Region X, Cordova Coastal, Alaska. States Department of Homeland Security, Federal Emergency Management Agency (FEMA): Washington, DC.

FEMA. 2011. Discovery Report, FEMA Region X, Kenai Peninsula Borough, Alaska. United States Department of Homeland Security, Federal Emergency Management Agency (FEMA): Washington, DC.

FEMA. 2011. Discovery Report, FEMA Region X, Kotzebue, Alaska. United States Department of Homeland Security, Federal Emergency Management Agency (FEMA): Washington, DC.

FEMA. 2011. Discovery Report, FEMA Region X, Valdez Project Area, Alaska. United States Department of Homeland Security, Federal Emergency Management Agency (FEMA): Washington, DC.

Flora, Cornelia and Jan Flora. 1994. "Community Sustainability and Forms of Capital." Department of Sociology, Iowa State University, Ames, IA. Unpublished manuscript.

GAO. 2003. Alaska Native Villages: Most are Affected by Flooding and Erosion, but Few Qualify for Federal Assistance (GAO-04-142). U. S. Government Accountability Office.

GAO. 2009. Alaska Native Villages: Limited Progress Has Been Made on Relocating Villages Threatened by Flooding and Erosion (GAO-09-551). U. S. Government Accountability Office.

Langon, Steve. 2002. The Native People of Alaska: Traditional Living in a Northern Land. Anchorage, AK: Greatland Graphics.

Martin, Dan. Modernization of the National Spatial Reference System. Proc. of 2011 Massachusetts Association of Land Surveyors & Civil Engineers, Hyannis, Massachusetts. www.aot.state.vt.us/geodetic/Advisor/Advisordoc/MALSCE_NSRS_10.pdf

Maune, David F., Ph.D., Dewberry. Digital Elevation Model (DEM) Data for the Alaska Statewide Digital Mapping Initiative (SDMI). Proc. of National Geospatial Advisory Committee Meeting, October 15, 2008, Shepherdstown, West Virginia. The Federal Geographic Data Committee. www.fgdc.gov/ngac/meetings/october-2008/dem-data-for-alaska.ppt

Miller, Christy, Steve Barber, and Elizabeth Benson. 2002. State of Alaska: Statewide Flood Hazard Map Modernization Plan. State of Alaska Department of Community and Economic Development, Division of Community and Business Development: Anchorage, AK.

Miller, Christy. 2008. Alaska's Flood Map Modernization Business Plan. State of Alaska Department of Community and Economic Development, Division of Community Advocacy: Anchorage, AK.

Minkel, David. National Geodetic Survey, NOAA. Upcoming Changes to the National Spatial Reference System. Proc. of American Congress on Surveying & Mapping Annual Conference, July 7-12, 2011, San Diego, California.

Morehouse, Thomas, Gerald McBeath, and Linda Leask. 1984. Alaska's Urban and Rural Governments. Lanham, MD: University Press of America.

Oppegard, Erik. JOA Surveys. "NOAA's National Height Modernization and GRAV-D: Putting It All Together." Problems with the Vertical Reference Frame in Alaska. Proc. of Alaska Surveying and Mapping Conference 2010, Anchorage, Alaska. www.ngs.noaa.gov/heightmod/AK20107ProbsWVerticalRefFrameIn0AKOppegard.ppt

Single Community Districts City and Borough of Juneau, City and Borough of Sitka, City and Borough of Wrangell, City and Borough of Yakutat, Angoon, Bethel, Cordova, Craig, Hoonah, Hydaburg, Kake, Klawock, Nome, Pelican, Petersburg, St Paul, Thorne Bay, Valdez, Whittier, Haines Borough, Municipality of Anchorage, Municipality of Skagway, Bristol Bay Borough.

State of Alaska. Department of Commerce, Community, and Economic Development, Division of Community and Regional Affairs. "Community Mapping", February 2009 (Pamphlet.)

State of Alaska. Department of Military and Veteran Affairs, Division of Homeland Security & Emergency Management, Oct. 2007. Web.

U.S. Army Corps of Engineers, Alaska District, Civil Works Floodplain Management Services Web Site. Web. www.poa.usace.army.mil/About/Offices/Engineering/FloodplainManagement.aspx

U.S. Department of Homeland Security. Federal Emergency Management Agency, "The National Flood Insurance Program" 14-May-2010 500 C Street SW, Washington, D.C. 20472 www.fema.gov/national-flood-insurance-program • www.fema.gov/national-flood-insurance-program-flood-hazard-mapping/map-modernization