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.

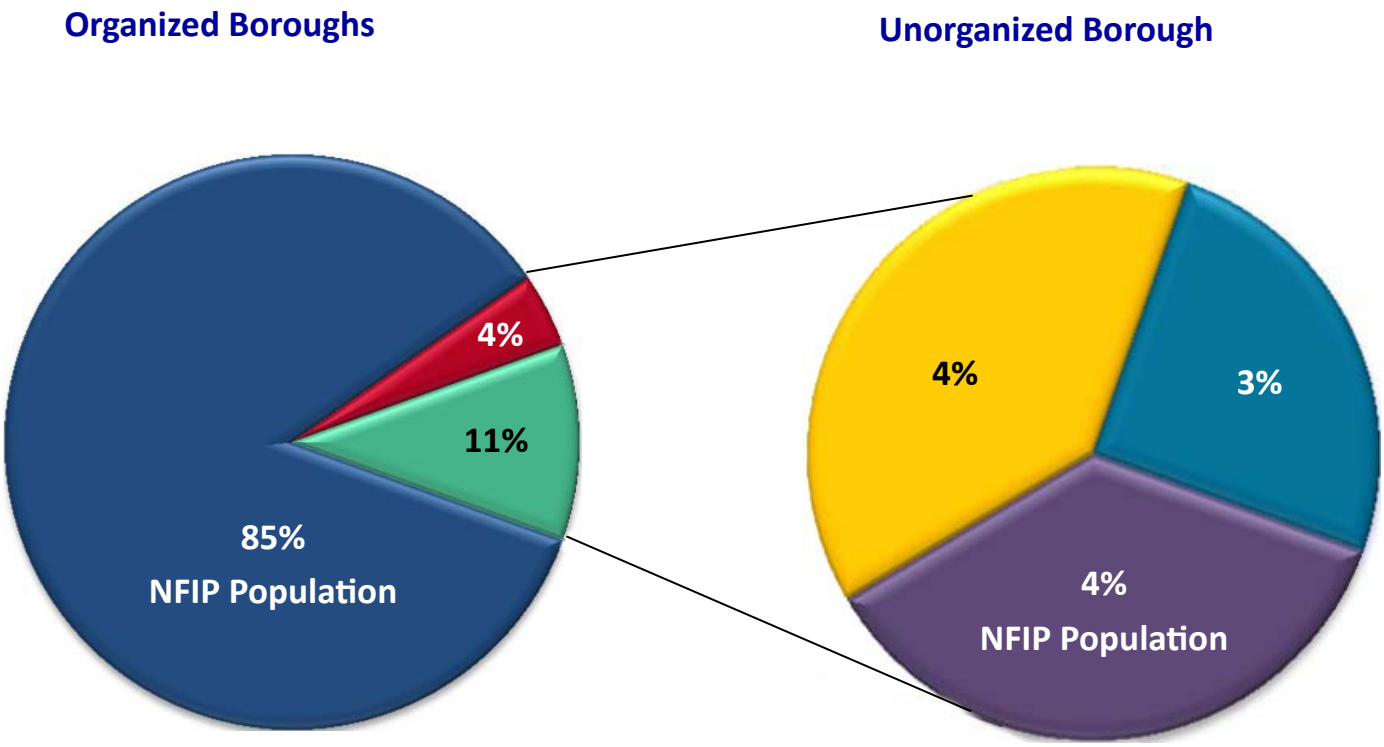
Slightly more than one-third (34 percent) of Alaska's 162 incorporated municipalities participate in the NFIP. In addition to the 32 NFIP-participating cities and boroughs, 24 cities located within the jurisdictional boundaries of participating boroughs enjoy the benefits of NFIP participation. Three 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

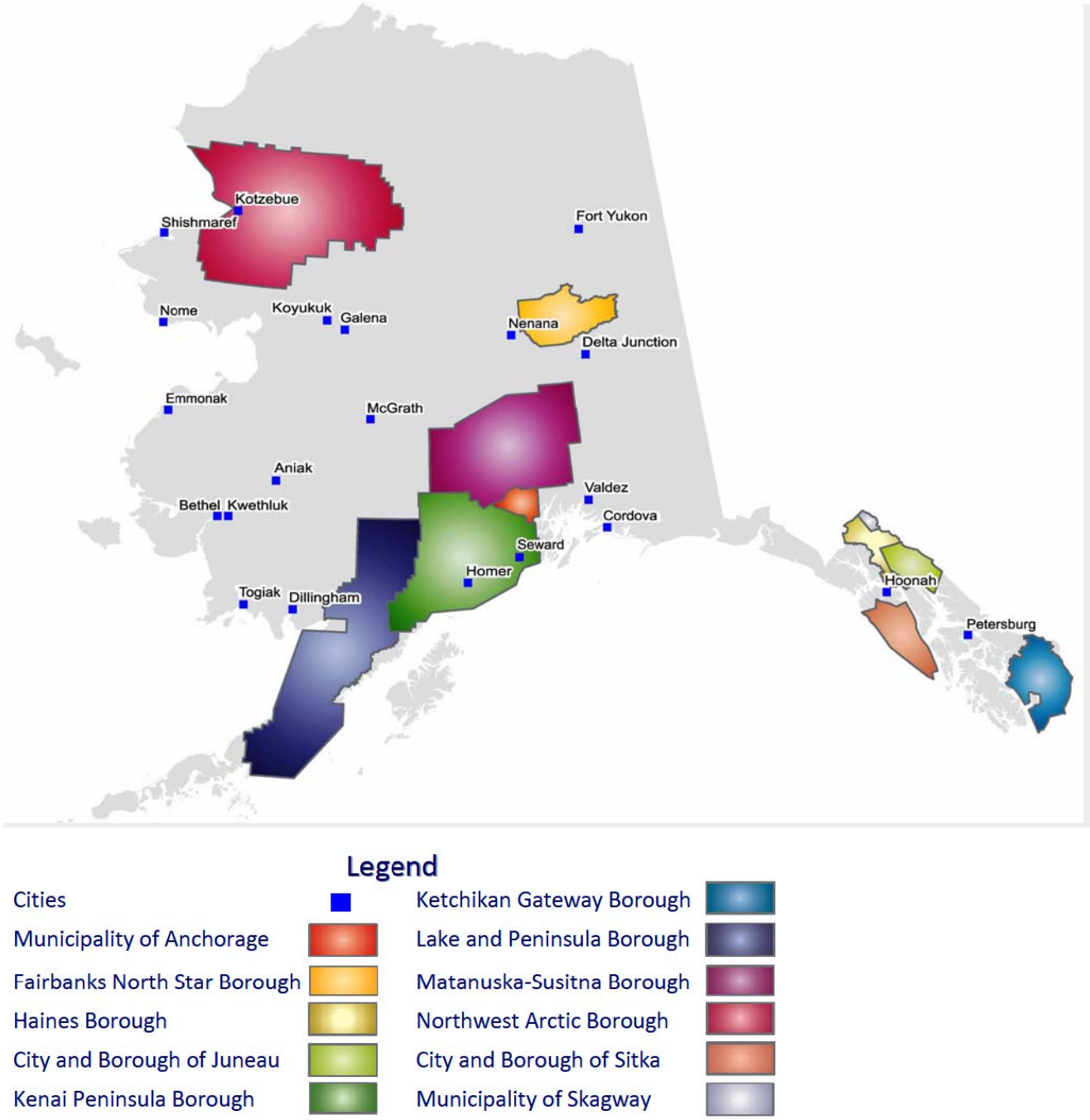


Table 3. NFIP Participating Communities in Alaska

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)

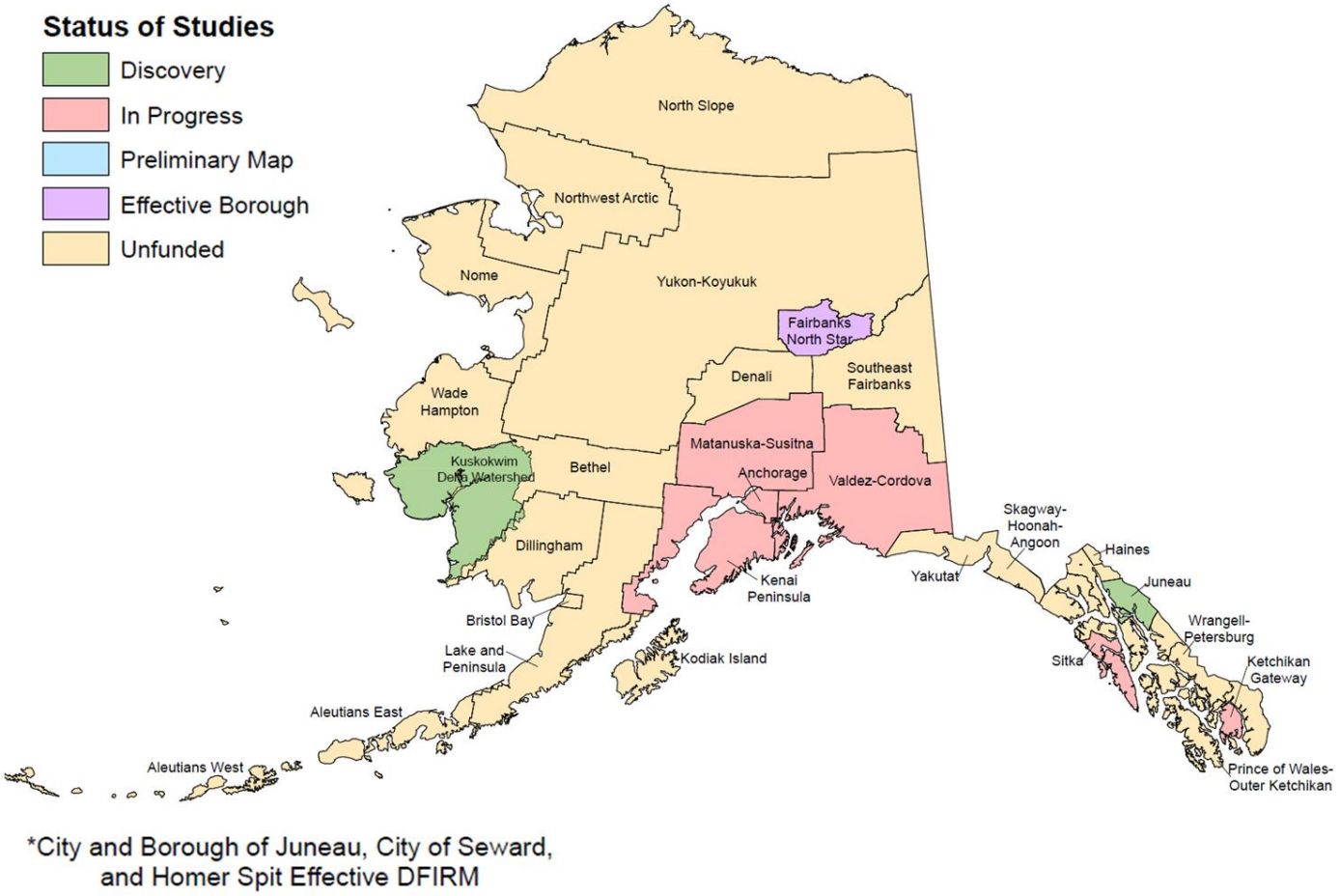
Community Name	FIRM	# FIRM Printed Panels	# FIRM Panels	Initial FIRM Date	Revised FIRM Date	FIRM Map Age	FIRM Effective Date	# Maps w/ LOMCs*
*Municipality of Anchorage	Yes	94	1975	5-Sep-79	18-Sep-87	0.6	25-Sep-09	3
City of Aniak	Yes	5	80	5-Sep-78	29-Sep-06	3.6	29-Sep-06	0
City of Bethel	Yes	8	64	28-Jun-74	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

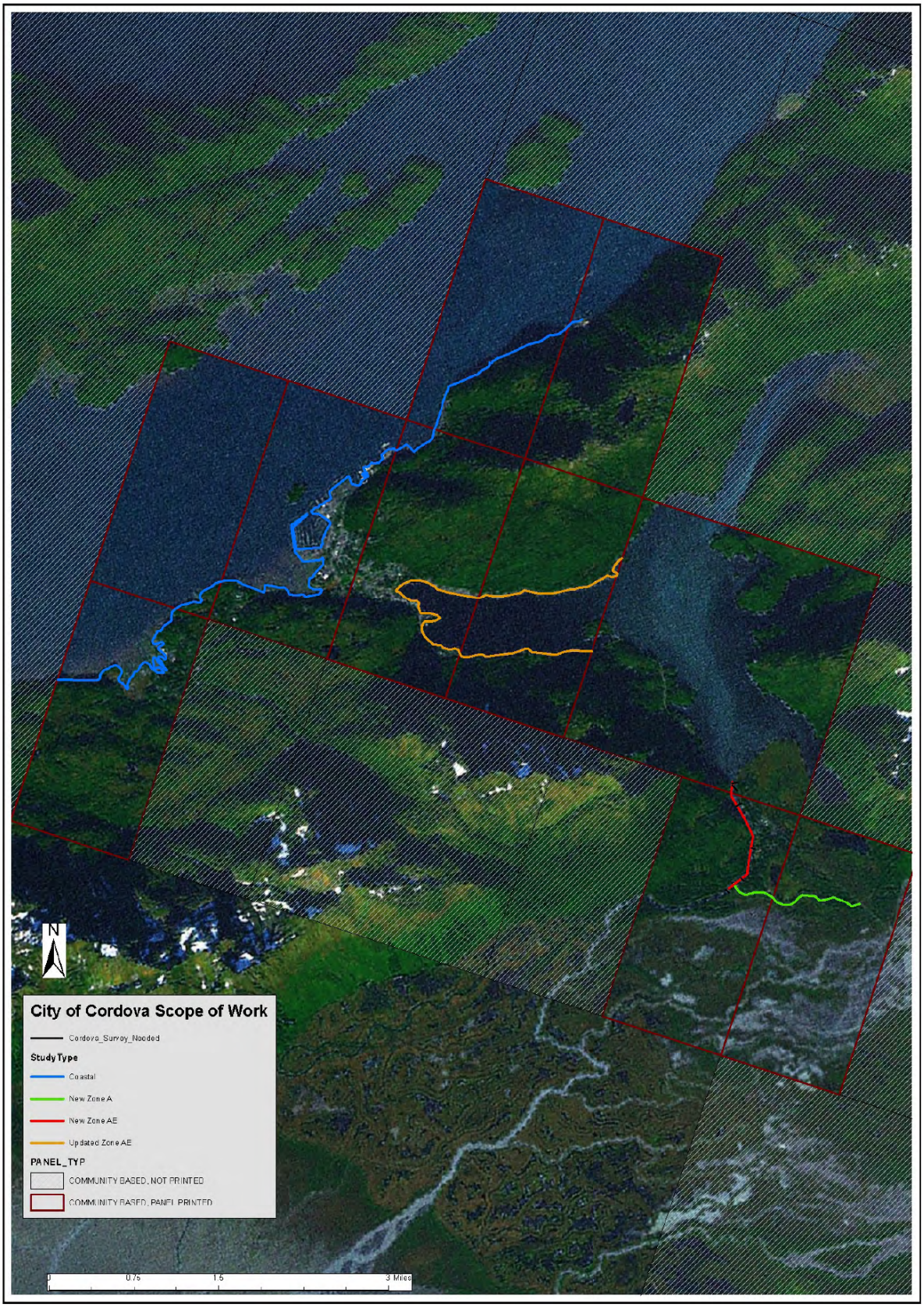
FEMA, State, and Local stakeholders participated in a Risk MAP Discovery Meeting held March 4, 2011 where community concerns were identified. These concerns were captured in the Risk MAP Discovery Report and delivered to the community. The table below illustrates project status and includes major milestones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

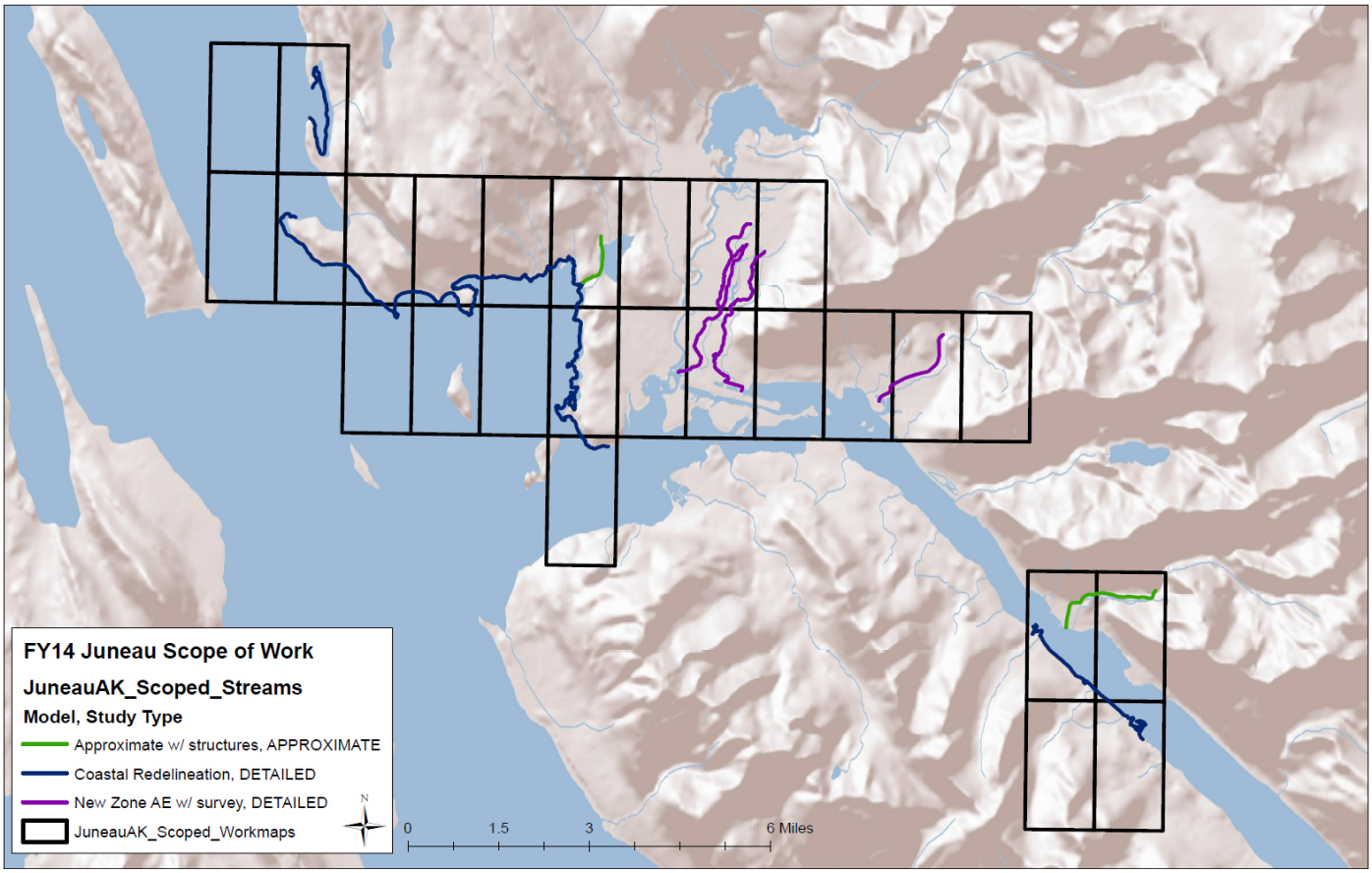
The table below outlines the engineering work scoped for the City and Borough of Juneau.

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

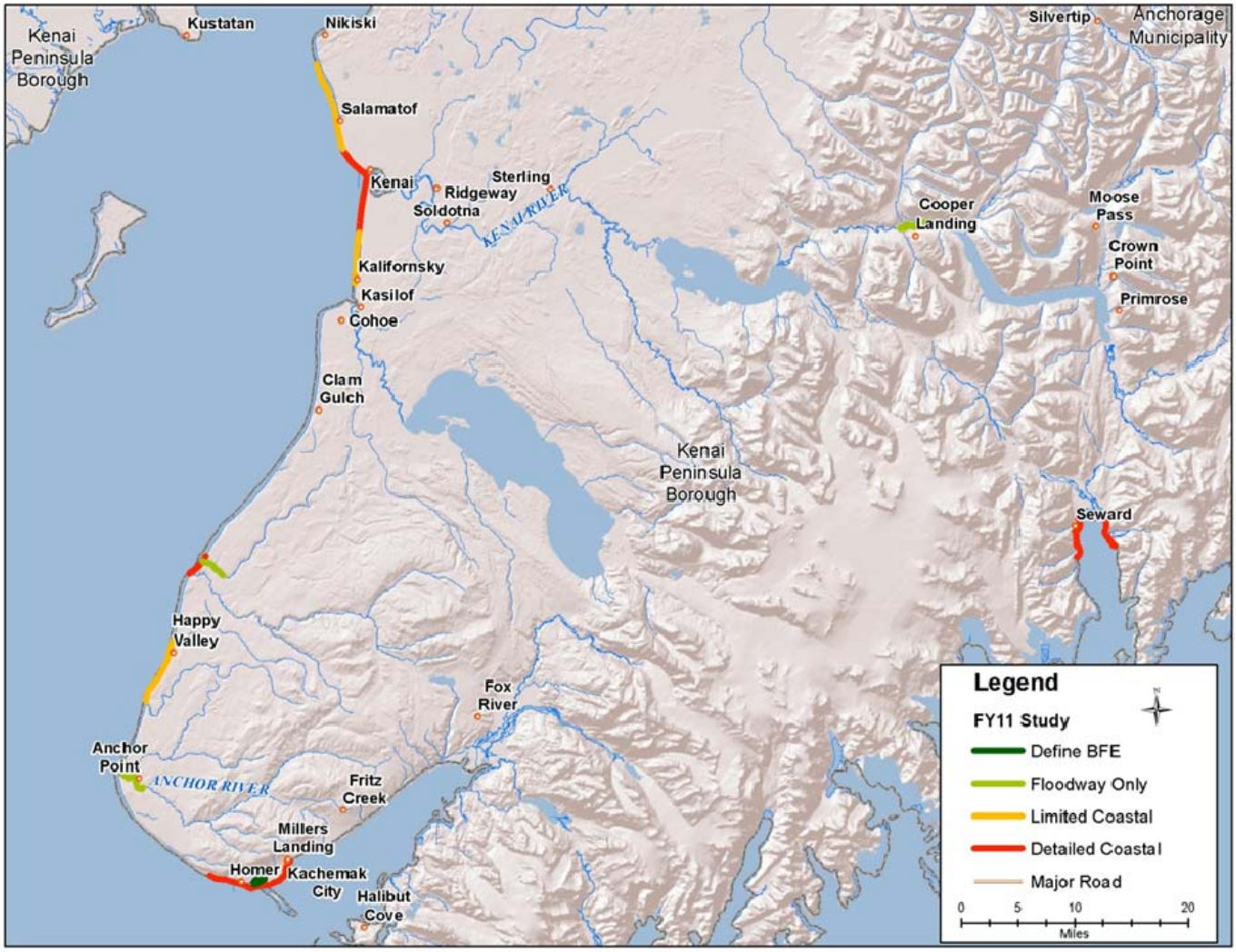
FEMA and the State of Alaska are conducting a coastal Risk MAP Study in the Kenai Peninsula Borough that began in 2011.

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

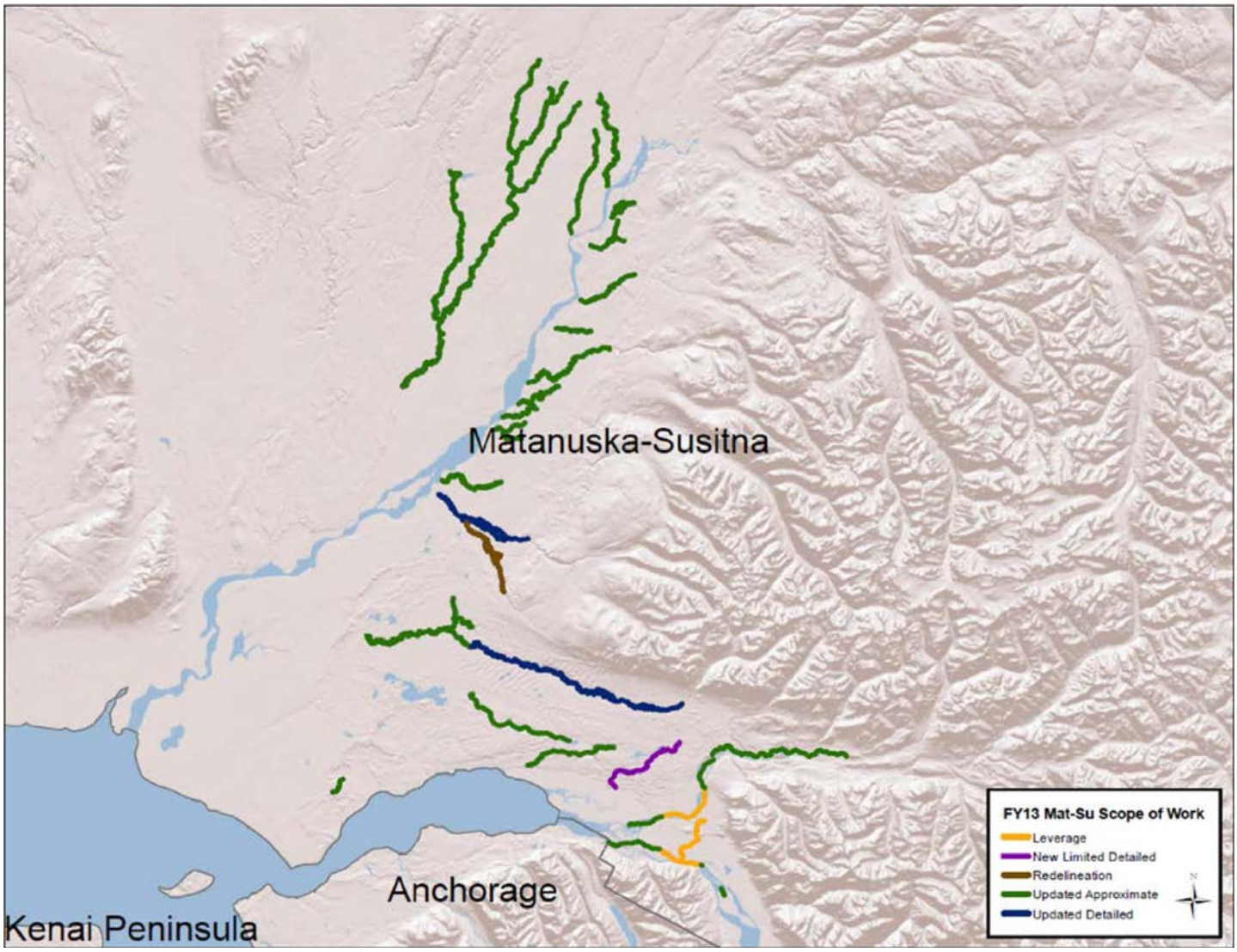
- Limited detail modeling (Zone A with structures) will be completed for:
    - ◊ Wasilla Creek = 10.7 miles

- 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

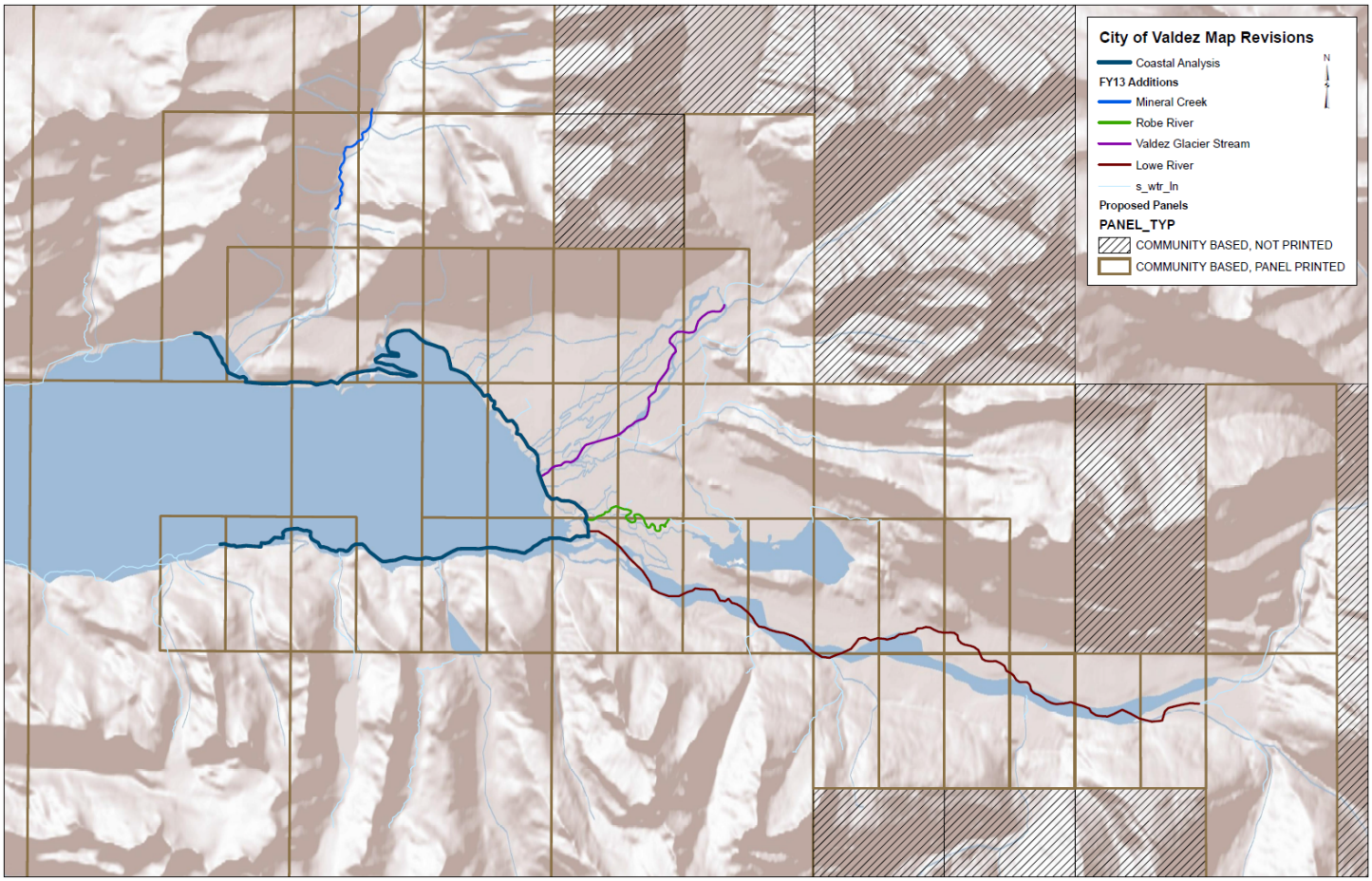
FEMA and the State of Alaska are conducting a coastal Risk MAP Study in the City of Valdez that began in 2013.

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.

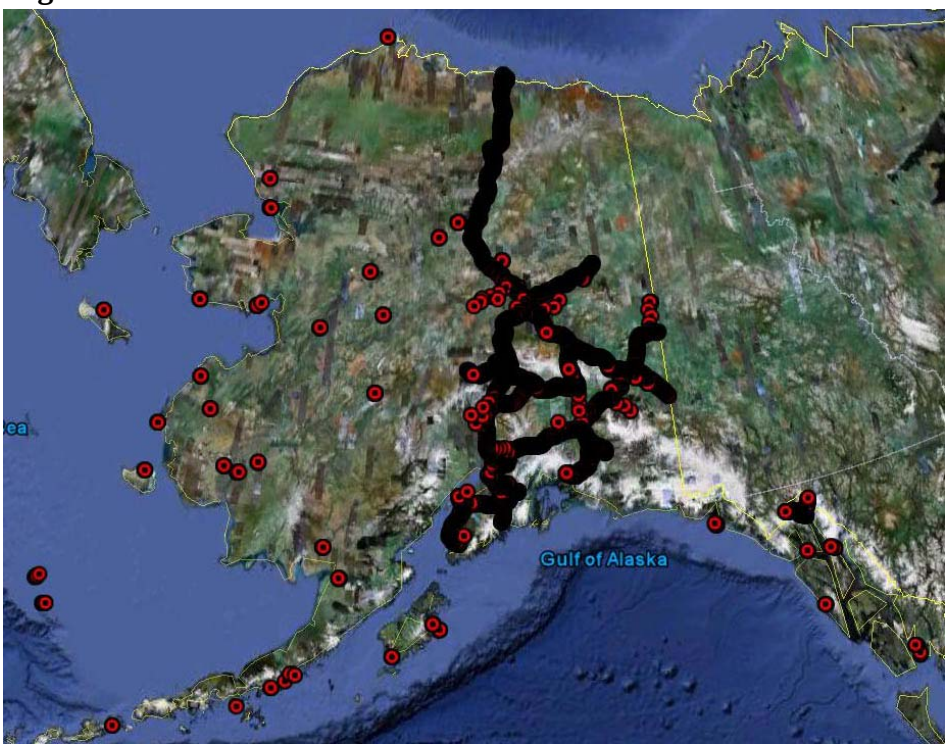
Perhaps the larger issue is the lack of density control points in Alaska's vertical reference system to adequately support sub-meter level accuracies for mapping and positioning activities. Nearly the entire western half of the state lacks NAVD benchmarks.[4]

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