Aerial View of Bethel, Alaska (Photo Provided by the USACE)

Discovery Report

FEMA Region 10

Kuskokwim Delta Watershed, Alaska

FEMA

Prepared by STARR

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I. Executive Summary

Kuskokwim Delta Watershed, Alaska

A Discovery Report has two goals: to inform communities of their risks related to natural hazards, and to enable communities to take actions to reduce these risks. This report discusses the risks and needs identified during the Kuskokwim Delta Discovery process.

Tribal, State, and local officials can use the data provided in this report to make their communities more resilient by updating a variety of local plans, communicating risk, informing the modification of development standards, identifying mitigation projects, and ultimately, taking action to reduce risk. The Federal Emergency Management Agency (FEMA) will hold several meetings with communities to help them through this process.

FEMA's Risk Mapping, Assessment, and Planning (Risk MAP) projects begin with Discovery. The overall goal of Risk MAP is to deliver quality data that increase public awareness and lead to action that reduces risk to life and property. The Discovery process is the first of many collaborative steps toward this goal. FEMA encourages stakeholders to remain involved and it will continue to communicate with communities in the Kuskokwim Delta Watershed project area to identify potential partnership opportunities for achieving resilience through mitigation action.

By first gaining a better understanding of existing local risk and mitigation actions during the Discovery phase, FEMA intends to work with communities to identify new mitigation actions and strengthen existing actions throughout the watershed. As a result of the Discovery process coordination, FEMA may select portions of the Kuskokwim Delta Watershed project area for advanced study, other products, or mitigation activities.

The Kuskokwim Delta Watershed Discovery Report provides users with a comprehensive understanding of historical flood risk, other natural hazards, and current mitigation activities within the watershed. The project area covers the Kuskokwim Delta Watershed, which includes the cities of Aniak, Bethel, and Kwethluk.

All communities in the Kuskokwim Delta Watershed project area had the opportunity to participate in the Discovery process, which involved collecting extensive data and initiating outreach efforts with local stakeholders. The data collected during these initial efforts were reviewed by the communities and other stakeholders during telephone interviews with the Risk MAP team (FEMA staff, consultants, and State representatives). These discussions included conversations about the local economy, floodplain and multi-hazard mapping needs, desired mitigation projects, and the identification of areas vulnerable to other hazards.

FEMA presented the results of the data collection and interviews to a larger stakeholder group at the Discovery Meetings that took place on June 15, 2016, in Bethel and Kwethluk, and on July 27, 2016, in Aniak, and held discussions on key questions regarding current and future community resilience. The participants also discussed a variety of natural hazards. The conversations raised additional issues and situations to be considered under future Risk MAP projects. The Kuskokwim Delta Watershed project area communities developed a list of desired potential mitigation projects related to multi-hazard risk, outreach, and training needs.

II. Discovery and Risk MAP

FEMA's Risk MAP program helps make communities stronger by identifying actions they can take now to reduce their risk to natural hazards. Through Risk MAP, FEMA provides information to enhance local plans to reduce risk, improve outreach about what communities can do to address that risk, and increase local resilience to hazards.

The Risk MAP program, implemented in coordination with State officials, identifies a community's risk by collaborating with local officials and stakeholders and asking about their existing ability to manage those risks. The program is intended to fill gaps that communities may have in managing the variety of hazards to which they are exposed. This is done by supplementing or enhancing the available hazard data, providing quantifiable assessments to identify vulnerable populations and essential facilities, and strengthening hazard mitigation planning efforts. Risk MAP products are a vital planning resource to better prioritize potential mitigation actions, assist with future funding, and allow a community to inform the public and best prepare for future events. This preparation decreases the hardships experienced when disasters occur, and enables a quicker recovery.

Figure 1: Risk MAP

Discovery is the first stage of the Risk MAP program. During Discovery, FEMA:

- Gathers information about local hazards and hazard risks;
- Reviews mitigation plans to understand local mitigation capabilities, hazard risk assessments, and current or future mitigation activities;
- Captures training, outreach, and data needs;
- Supports communities within the watershed in developing a vision for the watershed's future;
- Collects information from communities about their hazard history, development plans, daily operations, and hazard management activities; and
- Uses the information gathered to determine which areas of the watershed require mapping, risk assessment, or mitigation planning assistance through a Risk MAP project.

III. Watershed Description

The Kuskokwim Delta Watershed is located within the Bethel Census Area, Alaska, and encompasses about 55 percent of the Bethel Census Area, with an area of 24,986 square miles. The watershed sits on the southwestern edge of the State and boarders the Bering Sea. It is within the Yukon Delta National Wildlife Refuge.

Overall, the landscape of the Kuskokwim Delta Watershed is mountainous on the eastern edges, and highlands are in the central corridor. The remaining lands are mostly coastal lowlands. The watershed contains the largest river system in the State, composed of the Yukon River and the Kuskokwim River. The Yukon-Kuskokwim Delta, which is formed by the two river systems emptying into the Bering Sea on the western coast of Alaska, creates one of the largest delta systems in the world. The watershed contains virtually no road system. Travel is mostly by bush planes or by river boats in the summer and snow machines in the winter months.

The communities that participate in the National Flood Insurance Program (NFIP) inside the Kuskokwim Delta Watershed include the cities of Aniak, Bethel, and Kwethluk.

Map 1: Kuskokwim Delta Watershed Project Area Map

(See full-sized maps in Appendix D)

IV. Project Description and Methodology

FEMA Region 10 initiated the Discovery effort for the Kuskokwim Delta Watershed in April 2015. Risk MAP Discovery is a process of data collection, map making, and cooperative information exchange between community stakeholders to understand a watershed area, the risk to natural hazards, floodplain mapping needs, and other technical assistance that could be funded as part of this project.

Discovery is a rich collaboration between FEMA, consultants, and elected and appointed leaders at the State and local levels of government leading to a thorough understanding of natural and man-made hazards that communities face. This understanding leads to developing long-term strategies for mitigating the risk from these hazards.

Table 1: Data Sources for Region 10 Discovery

Alaska State Geospatial Data Clearinghouse	Alaska Statewide Digital Mapping Initiative	FEMA Regional Office
Alaska Interagency Coordination Center	City of Bethel	National Atlas of the United States
Alaska Department of Community and Regional Affairs	ESRI	National Oceanic and Atmospheric Administration (NOAA)
Alaska Department of Transportation	FEMA Community Information System (CIS)	U.S. Army Corps of Engineers National Levee Database
Alaska State Labor Workforce Development	FEMA Coordinated Needs Management Strategy tool	U.S. Geological Survey
	FEMA Map Service Center	
	FEMA Publications	

(See project-specific data sources in Appendix D)

i. Discovery Phases

The Discovery Process includes three phases. The first is a comprehensive collection of tabular (databases, spreadsheets) and spatial data (maps, GIS layers) from local, State, and Federal sources for Aniak, Bethel, and Kwethluk in the Kuskokwim Delta Watershed, as shown in Table 1 on the previous page. These data are later matched with information (including hazard mitigation concerns, environmentally sensitive areas, communication and outreach initiatives, ongoing planning efforts, and compliance and training needs) collected through interviews with each community. The Risk MAP team develops community fact sheets and Discovery Maps (included in the Appendix) using this information. An example of a community fact sheet is shown as Figure 2 below. Community fact sheets for Aniak, Bethel, and Kwethluk are included in Appendix C.

Region X Discovery Factsheet — Kuskokwim Delta Watershed

BETHEL, ALASKA

Borough:	Bethel Census Area	Status:	participating
CID:	020104	Current Map Date:	9/25/2009
LOMCs:	6	Reg-Level:	na
CRS:	No	CAC Date:	8/19/1993
		CAV Date:	5/7/2014

DEMOGRAPHICS

2010 Total Pop:	6,080	Language other than English (%):	38.6
Median Age:	28.7	High School Graduate or Higher (%):	84.2
65 years and older (%):	4.5	Bachelor Degree or Higher (%):	22.7
Native American (%):	71.3		

INDUSTRIAL

Population in Labor Force:	2,699	
Median HH Income ($):	77,500	
Top Industry (%):	40.4	Educational services, and health care and social assistance

PRESIDENTIALLY-DECLARED DISASTERS (borough)

Disaster Types:	Flooding, Severe Winter Storms and Avalanches, Heavy Snow, Ice Jams, Severe Freezing
Most Recent Disaster:	Flooding
Most Recent Disaster Date:	6/26/2002

NATIONAL FLOOD INSURANCE PROGRAM

Total Premiums ($):	126,736	No. of Variances:	0
Total Coverage ($):	23,191,100	No. of Rep Losses:	3
A-Zone:	81	No. of BCX Claims:	0
		Number of Policies:	91

LEVEES AND FLOOD CONTROL STRUCTURES

ENVIRONMENTALLY SENSITIVE, TRIBAL, AND COASTAL AREAS

Yukon Delta National Wildlife Refuge
National Forest Lands
Yup'ik Eskimos, Orutsararmuit Native Council

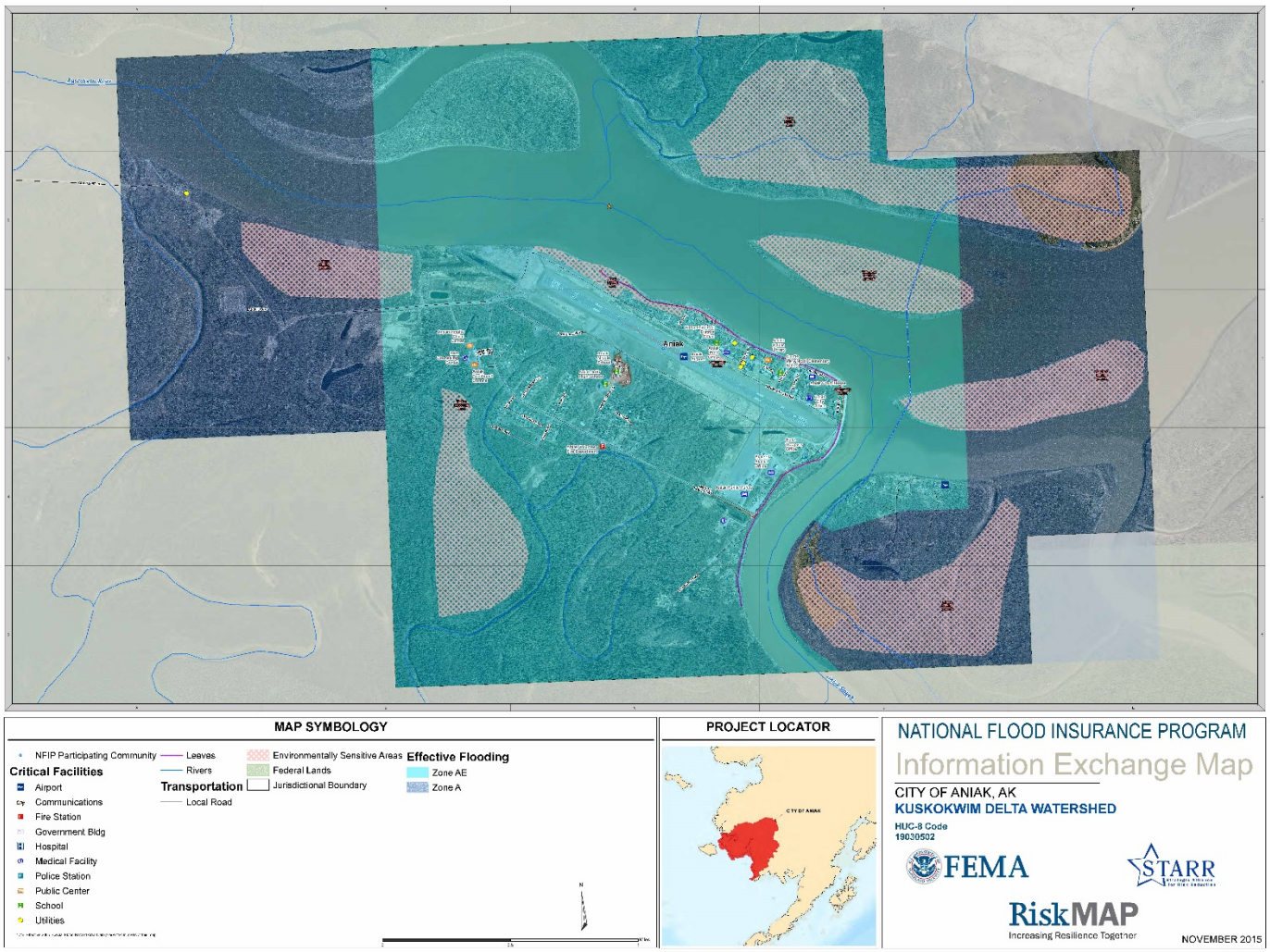
MITIGATION AND GRANTS

Update Bethel FIRM Maps - High
Pursue obtaining a CRS ranking to lower flood insurance rates - High
Obtain flood insurance for all City structures and continue compliance with NFIP - High
Research and consider instituting the NWS program of "Storm Ready" - High
Expand public awareness about NOAA weather radio for continuous broadcasts and warnings - High
Install siren to warn of severe weather events - High
Promote Fire Wise building design, siting, and materials for construction - High
Encourage development of earthquake resistance building codes and requirements - High

Figure 2: Fact Sheet for City of Bethel, Alaska

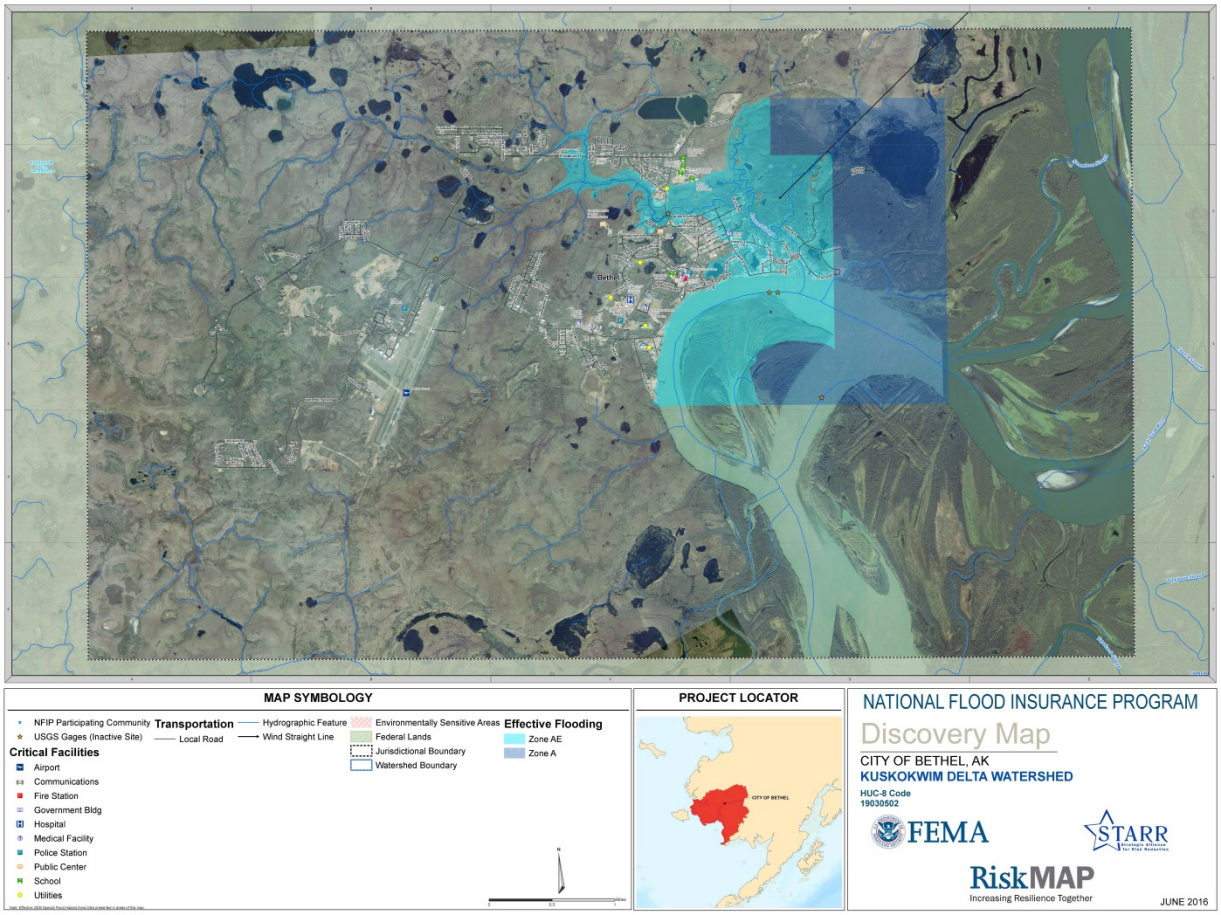
(See tabular data in Appendix C)

Community officials receive copies of these materials prior to Phase 2, when they are asked to review and comment on this initial analysis during an in-person or telephone interview with the Risk MAP team. Through their local knowledge and experience, community officials add tremendously to the overall understanding of the watershed, its history, economy, hazards, and opportunities. "Areas and Points of Concern" are identified in Phase 2 (see Map 2). These can include floodplain mapping needs, desired flood mitigation projects, and other areas in the community that are vulnerable to hazards.



Map 2: Community Interview Reference Map for the City of Aniak

Phase 3 builds on preliminary mapping through the Discovery Meeting, which facilitates discussion and builds consensus about study needs, mitigation project needs, desired compliance support, and local flood risk awareness efforts. Attendees—including watershed communities and other stakeholders—identify possible solutions for the areas and points of concern shown on the Discovery Meeting Map (see Map 3 and Appendix C). These might include floodplain studies, flood mitigation projects, enforcement of various regulations, and training for community officials. New issues for further study might be identified through this discussion. The final Discovery Maps, including results from discussions during the in-person meetings for Aniak, Bethel and Kwethluk, are included in Appendix D.



Map 3: Discovery Meeting Map for the City of Bethel

V. Risk Map Needs

The results of the data collection and interviews were thoroughly discussed at the Discovery Meeting. The following sections include issues and situations that exist in the Kuskokwim Delta Watershed communities that can be considered Risk MAP needs, to be addressed with Risk MAP projects. Details and background on all issues can be found in the interview notes, meeting notes, and other files included in Appendix C.

ii. Floodplain Studies and Risk Assessment

Table 2 provides a listing of the most recent updates to Flood Insurance Study (FIS) reports and Flood Insurance Rate Maps (FIRMs), as well as information regarding whether the studies include detailed floodplain analyses. The following communities are included as part of the Discovery process.

Table 2: Kuskokwim Delta Watershed Most Recent FIRMs and FIS

Borough	Community	Latest FIRM	Latest FIS	Detailed
Bethel Census Area	Aniak	9/29/2006	4/2/1990	Yes
Bethel Census Area	Bethel	9/25/2009	9/25/2009	Yes
Bethel Census Area	Kwethluk	N/A	N/A	N/A

The final Discovery Map should be referenced to view spatial data that may be indicative of study needs. Items of interest include areas of concern expressed by State and local officials, critical facilities, existing floodplains, Letters of Map Change, erosion, wildland fires, and flooding.

Detailed Light Detection and Ranging (LiDAR) data exists for the City of Kwethluk, which is in the "emergency stage" for floodplain mapping.

One levee system was identified in the City of Aniak along the Kuskokwim River through a combination of the U.S. Army Corps of Engineers (USACE) National Levee Database, FEMA's Regional Flood Hazard Layers, and the Mid-Term Levee Inventory, as well as from information obtained in the community interview.

Discovery action and follow-up items are not particularly linked to floodplain mapping needs, but are associated with risk assessment as a whole. This is based on community stakeholder responses and is summarized in Table 3.

Table 3: Kuskokwim Delta Watershed Risk Assessment

STUDY AREA	STUDY LENGTH (miles)	LOCATION DESCRIPTION	STUDY TYPE
Kuskokwim River Levee – City of Aniak	N/A	The entity responsible for maintaining the city levee system is unknown. USACE adds additional concrete to the structure. The City Public Works Department removes trees on the levee system.	Levee Inspection/Certification
Kuskokwim River Levee – City of Aniak	N/A	Based on the 2006 effective FIRMs, it needs to be determined if the levee system provides protection. Updates to the FIRMs will need to be performed if the system does provide protection.	Levee Analysis/Updated Mapping

STUDY AREA	STUDY LENGTH (miles)	LOCATION DESCRIPTION	STUDY TYPE
City of Aniak	N/A	Past High Water Marks (HWMs) are missing throughout the city. No marks exist on the Aniak Slough side of the community. The city is interested in developing and installing new HWMs.	Field Survey Analysis
Aniak Airport - City of Aniak	N/A	There is concern among city officials that the new runway alignment will change the drainage patterns around the community. When the airport floods, the runway is inundated.	Stormwater Management
City of Aniak	N/A	Most homes within the community appear to be elevated, but the community is not sure if the elevations are accurate. Many homes are elevated on gravel pads; however, the pads are eroding away.	Risk Assessment
City of Aniak	N/A	USACE conducted an erosion assessment in 2009. City officials would be interested in comparing imagery flown pre- and post-assessment to gain a better understanding of the rate of erosion.	Erosion Assessment
City of Aniak	N/A	City officials would like to have the Alaska Department of Transportation include erosion mitigation in the runway project because it will need to be protected.	Erosion Assessment
Kuskokwim River Levee – City of Aniak	N/A	The levee/dike is eroding and the city feels riprap or something similar is needed to reduce future erosion.	Erosion Assessment
City of Aniak	N/A	Erosion is cutting inland and has made the old dump site susceptible to flooding, which then sends garbage down the river.	Erosion Assessment
City of Aniak	N/A	The city has an evacuation plan, which was last examined 4 years ago. The plan could be revisited for a future update, if needed.	Plan Updating
City of Aniak	N/A	The city would like to see the development of a preparedness plan and more outreach related to preparedness efforts.	Local Planning
City of Aniak	N/A	The city is not aware of the annual Hazard Mitigation Plan team meeting requirements; however, the city likes the idea and is interested in receiving assistance with this meeting.	Meeting/Plan Implementation
City of Aniak	N/A	There are multiple areas around the city where breaklines are needed (these were marked on the in-person Discovery Meeting Map). The fire chief would like to see more training for the public on fire risk/prevention. The city is very short-handed on firefighting capabilities. They need assistance developing and training a volunteer team.	Wildfire Risk Assessment/ Potential Fire Assistance Grants
City of Bethel	N/A	The city has training needs related to benefit-cost analysis.	Benefit-Cost Analysis
City of Bethel	N/A	Residents would like more information on permafrost thawing and future development throughout the city. This issue has caused problems for foundations and roads in the last 50 years.	Permafrost Study
City of Bethel	N/A	The city's grants manager mentioned a local desire for severe winter storm analysis.	Severe Winter Storm Assessment/Analysis

STUDY AREA	STUDY LENGTH (miles)	LOCATION DESCRIPTION	STUDY TYPE
City of Bethel	N/A	The city grants manager wants to add man-made hazards, public health, and oil and hazardous waste spills to the hazard mitigation plan.	Plan Updating
City of Bethel	N/A	There is local desire for State assistance in updating the local emergency operations plan.	Local Planning
City of Bethel	N/A	There is local desire for State assistance or a template for writing a local HAZMAT response plan.	Local Planning
City of Bethel	N/A	City officials are interested in a navigation study done from Bethel down to the Johnson River.	Navigation Study
City of Kwethluk	N/A	A tundra wildfire burned near the runway in 2015. There are no working fire trucks, but the city does have hydrants. There is an interest in learning more about defensible space.	Wildfire Risk Awareness/Assistance to Firefighters Grants
City of Kwethluk	N/A	The city would like to obtain more information on suitable locations for sewer/solid waste disposal in relation to changes in flooding due to climate change. The city is not in agreement with the USACE engineering data and risk to the environment.	Suitability Study Analysis
City of Kwethluk	N/A	The mayor described building collapses due to permafrost thawing. The city would like more information on changes and specifically what the community could do to mitigate.	Permafrost Study
City of Kwethluk	N/A	Erosion remains an ongoing issue. The community has already moved a couple of homes because of erosion from a storm event a couple of years ago. There are more homes they would like to move.	Erosion Assessment
City of Kwethluk	N/A	The comprehensive plan (originated in 1998) was updated in 2014; however, the community expressed a desire to do a better job of defining where they want to be and what they want to be in a changing landscape.	Local Planning

iii. Mitigation Projects

Available mitigation plans in the Kuskokwim Delta Watershed are prepared at the community level. Below is a listing of the communities and the date of their most recent Hazard Mitigation Plan:

- City of Aniak – Hazard Mitigation Plan Update, dated December 8, 2015
- City of Bethel – Local Hazards Mitigation Plan, dated March 12, 2008
- City of Kwethluk – Local Multi-Hazard Mitigation Plan, dated February 10, 2010

Table 4 lists several high-priority mitigation projects that were identified by the communities.

Table 4: Community High-Priority Mitigation Projects

ACTION ITEM	ANIAK	BETHEL	KWETHLUK
FLOODING			
Dike improvements	●		
Updated FIRM Bethel maps		●	
Pursue obtaining a Community Rating System rating to lower flood insurance rates		●	
Obtain flood insurance for all city structures, and continue compliance with NFIP regulations		●	●
Bethel cargo dock/replacement seawall		●	
Repair and expand harbor		●	
Continued repair of existing seawall		●	
Suite of emergency plans and training/drills			●
Kwethluk floodplain maps			●
Public education			●
Work with property owners that have repetitive loss damages to mitigate future flooding	●		
SEVERE STORM			
Research and consider instituting the National Weather Service "Storm Ready" program	●	●	●
Conduct special awareness activities, such as Winter Weather Awareness Week, Flood Awareness Week, etc.	●	●	●
Expand public awareness about NOAA Weather Radio for continuous weather broadcasting and warning tone alert capability	●	●	●
Install a siren to warn people of a severe weather event		●	
WILDFIRE			
Promote Firewise building design, siting, and materials for construction	●	●	
Continue to support the local fire department with adequate firefighting equipment and training		●	
Continue to enforce the development of building codes and requirements for new construction		●	

ACTION ITEM	ANIAK	BETHEL	KWETHLUK
Enhance public awareness of potential risk to life and personal property. Encourage mitigation measures in the immediate vicinity of their property.	●	●	●
Become a Firewise community.			●
Consider developing building codes and requirements for new construction			●
Encourage mitigation measures in the immediate vicinity of their property such as firebreaks, which greatly assist in controlling wildland fires. They can be developed in the form of roads and natural water channels. The firebreaks would also provide transportation corridors.	●		
EARTHQUAKE			
If funding is available, perform an engineering assessment of the earthquake vulnerability of identified critical infrastructure owned by the city.	●	●	
Identify buildings and facilities that must be able to remain operable during and following an earthquake event.		●	●
Install non-structural seismic restraints for large furniture such as bookcases, filing cabinets, heavy televisions, and appliances to prevent toppling damage and resultant injuries to small children, the elderly, and pets	●		
Perform an engineering assessment of the earthquake vulnerability of identified critical infrastructure owned by the City of Aniak	●		
MULTI-HAZARDS			
Identify and pursue funding opportunities to implement mitigation actions	●		
Encourage individuals to apply mitigation measures in the immediate vicinity of their properties	●		
Research and consider instituting the “Storm Ready” Weather Service program	●		
Conduct special outreach/awareness activities, such as Winter Weather Awareness Week, Flood Awareness Week, etc.	●		
Expand public awareness about NOAA Weather Radio for continuous weather broadcasts and warning tone alert capability.	●		

Table 5 provides a listing of desired mitigation actions or needs that were gathered from the communities throughout the Discovery process.

Table 5: Community Hazards and Mitigation Actions

JURISDICTION	HAZARD LOCATION	DESCRIPTION	MITIGATION ACTION
Aniak, City of	Southeast end of airport runway	Culvert backing up into the city along Boundary Ave. and First Street	Culvert Expansion/Regular Maintenance
Aniak, City of	Morgans Road	Local drainage causes flooding along Morgans Road; lack of culvert(s) in area to channel water from ponding in low-lying spots	Improve Stormwater Drainage System Capacity
Aniak, City of	Kuskokwim River	Erosion occurs along the western bank of Kuskokwim River, which may cause the runway to move to the south. This would affect schools and State police.	Bank Stabilization Techniques (riprap)
Aniak, City of	East Aniak (island)	Frequent flooding occurs on East Aniak (island). Flooding from the Aniak Slough occurs due to ice jamming on the Kuskokwim River.	Ice Jam Prevention Techniques
Aniak, City of	Citywide	Removal of fuels for wildfire prevention throughout certain areas of the city most susceptible to wildfire hazards.	Implement a Fuels Management Program
Aniak, City of	Citywide	Need for fire break lines installed around certain developed areas of the city.	Cut fire breaks in wildland-urban interface
Aniak, City of	East Aniak (island)	Helipad installed 10 years ago for evacuations, but not fully maintained	Routinely maintain by pruning vegetation/grasses
Aniak, City of	East Aniak (island)	Need for a fire suppression system with smokehouses and grass vegetation	Use of fire blanket/extinguisher or sprinkler system
Aniak, City of	Kuskokwim River	Need for protection of roadway as flooding occurred at the intersection of High School Road and Airport Boulevard.	Elevating roadway / installation of storm drainage system
Aniak, City of	Kuskokwim River	Need for additional riprap to existing levee structure.	Use of revetments to protect against flooding
Aniak, City of	Kuskokwim River	Install flood gates to reduce risk of flooding around airport grounds.	Flood-control structures built to prevent flood damage
Bethel, City of	Citywide	Need for permafrost study/mitigation measures to prevent future issues	Adopting an ordinance promoting permafrost sensitive construction practices
Bethel, City of	Kuskokwim River	Need for an extension to the existing seawall and reinforcement of banks	Using bioengineered bank stabilization, sloping or grading techniques, or riprap boulders
Bethel, City of	Proposed dock on the Kuskokwim River	City officials would like to build a new dock on the river and are concerned about the sediment deposition around the structure based on channel migration.	Planting sediment-trapping vegetation to buffer the dock against sediment collection
Kwethluk, City of	Airport Access Road	There is a low-lying area where water backs up over the Airport Access road.	Elevate roadway or install drainage culvert

iv. Compliance

Data collected from CIS indicated that the communities in the Kuskokwim Delta Watershed had zero variances to their floodplain management ordinances, so it may be assumed that these communities are regulating to at least the minimum criteria required by FEMA. The most recent FEMA Community Assistance Contact/Visit was in May 2014 with the City of Bethel. FEMA previously met with officials from the City of Kwethluk in August 2012, and with officials from the City of Aniak in June 2005. No training sessions or other compliance support were requested at the Discovery Meetings.

v. Communication

In interviews, all communities indicated that they were interested in learning more about Risk MAP's communication support, and were open to a future meeting with FEMA to learn about how they can improve their communication program through targeted outreach for individuals at risk to flood, wildfire, earthquake, severe storm, and man-made hazards.

The population of the project area is diverse. The largest city within the Bethel Census Area is Bethel (6,080 residents). The median age of residents varies between a low of 23.4 years in the City of Kwethluk to a high of 30.3 years in the City of Aniak. The community with the highest percentage of non-English speakers is the City of Kwethluk with 90.3 percent of the population speaking another language. The other communities with a high percentage of non-English speakers are the City of Bethel at 38.6 percent, and the City of Aniak at 23.6 percent. The City of Kwethluk has the largest Native American population of 97.5 percent. The other communities with a high percentage of Native American residents are the City of Aniak at 79.2 percent, and the City of Bethel at 71.3 percent. The percentage of the population that holds a high school diploma varies from 69 percent in the City of Kwethluk to 84.2 percent in the City of Bethel. As of 2010, the percentage of the population with a college degree varies from 3.7 percent in the City of Kwethluk to 22.7 percent in the City of Bethel. Household incomes for each community vary. The City of Bethel has an average household income of approximately $77,500, with Educational Services, Health Care, and Social Assistance as the most popular industries for employment. The City of Aniak has an average household income of approximately $63,173, with Educational Services, Health Care, and Social Assistance also being the most popular industries. The City of Kwethluk has an average household income of approximately $43,125 with Educational Services, Health Care, and Social Assistance as the most common industries. Due to the varying ages, education levels, and languages spoken at home within the demographic data, outreach strategies would need to be tailored to communities within the jurisdiction.

The local officials were all interested in learning more about how to provide multi-hazard risk information to residents. Community representatives indicated the need for better connections and delivery methods to keep the public informed, engaged, and aware of risks presented by multiple hazards in the area.

V. Conclusion

Local officials in the communities were interested in the Discovery process and Risk MAP and open to learning more about how they can begin to develop resiliency to flood, seismic, wildfire, severe storm, landslide, and man-made events. They identified areas for map updates and areas in which they could use additional FEMA technical support. It is recommended that the guidance document outlining the types of mitigation planning technical support that can be included in Risk MAP projects be evaluated with communities, once finalized. Additionally, the local officials in this watershed would benefit from the implementation of Risk MAP projects, such as mitigation

technical assistance, or development of multi-hazard risk assessment products, in addition to the standard regulatory products.

VI. Appendix – Discovery Files

The Discovery Report appendices are stored digitally under their respective folders and can be downloaded at:

http://www.starr-team.com/starr/RegionalWorkspaces/RegionX/Kuskokwim/Shared%20Documents/Discovery_Report/

Appendix A – Project Team Contact Information

Appendix B – Stakeholder Contact Information

- Community Stakeholder Contact Information

Appendix C – Discovery Interviews/Meetings

- Community Factsheets
- Community Hazard Mitigation Plans
- Community Interview Notes
- Discovery Meeting Maps
- Discovery Meeting Summary Notes

Appendix D – Discovery Report

- Data Sources for Discovery
- Discovery Geodatabase
- Final Discovery Maps
- Project Area Map