City of Togiak, Alaska

Hazard Mitigation Plan - 2018 Update

Prepared by:

City of Togiak

LeMay Engineering & Consulting, Inc.

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the Alaska State Division of Homeland Security & Emergency Management and
the Federal Emergency Management Agency.

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Acronyms

°F	Degrees Fahrenheit
AEIC	Alaska Earthquake Information Center
AVEC	Alaska Village Electric Cooperative
AVO	Alaska Volcano Observatory
BCA	Benefit-Cost Analysis
BFE	Base Flood Elevation (100-year flood)
BIA	Bureau of Indian Affairs
CC	Climate Change
CFR	Code of Federal Regulations
DCCED	(Alaska) Department of Commerce, Community, and Economic Development
DCRA	(DCCED) Division of Community and Regional Affairs
DEC	(Alaska) Department of Environmental Conservation
DHS&EM	(Alaska) Division of Homeland Security and Emergency Management
DOT&PF	(Alaska) Department of Transportation and Public Facilities
E	Earthquake
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Maps
FLD	Flood and Erosion
HMP	Hazard Mitigation Plan
HMGP	Hazard Mitigation Grant Program
MPH	Miles per Hour
NFIP	National Flood Insurance Program
NOAA	National Oceanic and Atmospheric Administration
PDMG	Pre-Disaster Mitigation Grant
SBA	Small Business Administration
SW	Severe Weather
UAF	University of Alaska Fairbanks
USACE	United States Army Corps of Engineers
USGS	United States Geological Survey
V	Volcano

FEMA Approval Letter

U.S. Department of Homeland Security
FEMA Region 10
130 – 228th Street, SW
Bothell, Washington 98021-8627

FEMA

February 13, 2019

The Honorable Anna May Kasak
Mayor, City of Togiak
P.O. Box 190
Togiak, AK 99678

Dear Mayor Kasak:

On February 12, 2019, the U.S. Department of Homeland Security's Federal Emergency Management Agency (FEMA) Region 10, approved the *City of Togiak Hazard Mitigation Plan Update* as a local plan as outlined in Code of Federal Regulations Title 44 Part 201. This approval provides the jurisdiction eligibility to apply for the Robert T. Stafford Disaster Relief and Emergency Assistance Act's, Hazard Mitigation Assistance (HMA) grants projects through February 11, 2024, through your state.

FEMA individually evaluates all application requests for funding according to the specific eligibility requirements of the applicable program. Though a specific mitigation activity or project identified in the plan may meet the eligibility requirements, it may not automatically receive approval for FEMA funding under any of the aforementioned programs.

Over the next five years, we encourage your communities to follow the plan's schedule for monitoring and updating, and to develop further mitigation actions. To continue eligibility, jurisdictions must review, revise as appropriate, and resubmit the plan within five years of the original approval date.

If you have questions regarding your plan's approval or FEMA's mitigation grant programs, please contact Mike Johnson, Emergency Management Specialist with Alaska Division of Homeland Security and Emergency Management, at (907) 428-7055, who locally coordinates and administers these efforts.

Sincerely,

Mark Carey, Director
Mitigation Division

cc: Brent Nichols, Alaska Division of Homeland Security and Emergency Management

Enclosure

KS:vl

Adoption Resolution

City of Togiak, Alaska

Multi-Hazard Mitigation Plan Adoption Resolution

Resolution # 19-04

Adoption of the City of Togiak Multi-Hazard Mitigation Plan

Whereas, the City of Togiak recognizes the threat that local hazards pose to people and Property; and

Whereas, undertaking hazard mitigation projects before disasters occur will reduce the Potential for harm to people and property and save taxpayer dollars; and

Whereas, an adopted Multi-Hazard Mitigation Plan is required as a condition of future grant Funding for mitigation projects; and

Whereas, the Togiak Multi-Hazard Mitigation Plan has been sent to the Alaska Division of Homeland Security and Emergency Management and the Federal Emergency Management Agency for Their approval;

Now, therefore, be it resolved, that the Togiak City Council, hereby adopts the City of Togiak Multi-Hazard Plan as an official plan; and

Be it further resolved, that the City of Togiak will submit the adopted Multi-Hazard Mitigation Plan to the Alaska Division of Homeland Security and Emergency Management and the Federal Emergency Management Agency officials for the final review and approval.

Passed: 2/5/19

Date

Anne May Kasak

Mayor

Darryl J. Thompson

City Administrator

Chapter 1. Planning Process and Methodology

Introduction

Hazard mitigation is any sustained action taken to reduce or eliminate long-term risk to human life and property from hazards. Mitigation activities may be implemented prior to, during, or after an incident; however, it has been demonstrated that hazard mitigation is most effective when based on an inclusive, comprehensive, long-term plan that is developed before a disaster occurs (FEMA 386-8).

Local mitigation plan regulations are found in the Code of Federal Regulations (CFR) at 44 CFR Part 201. This plan has been developed using the regulations to ensure compliance with Federal criteria.

Federal regulations specify that local mitigation plans be designed to help jurisdictions identify specific actions to reduce loss of life and property from natural hazards. These plans are not intended to help jurisdictions establish procedures to respond to disasters or write an emergency operations plan. The goal of mitigation is to decrease the need for response as opposed to increasing response capability (FEMA 386-8).

The City of Togiak Hazard Mitigation Plan (HMP) includes information to assist the City government and residents with planning to avoid potential future disaster losses. This HMP provides information on natural hazards that affect Togiak, gives descriptions of past disasters, and lists projects that may help the community prevent disaster losses. This HMP was developed to help the City make decisions regarding natural hazards with the potential to affect Togiak: flooding/erosion, severe weather, earthquake, volcano, and climate change.

Plan Development

Project Staff

Table 1 lists members of the Planning Team for the 2018 Togiak HMP Update. The State of Alaska, Division of Homeland Security and Emergency Management (DHS&EM) provided funding and project oversight. LeMay Engineering & Consulting, Inc., DHS&EM's contractor, provided assistance to the Planning Team.

Table 1. Planning Team

NAME	TITLE	ORGANIZATION	PHONE
Anna May Kasak	Mayor	City of Togiak	(907) 891-5685
Darryl Thompson	City Administrator	City of Togiak	(907) 493-2087
Anecia Kritz	City Council Member	City of Togiak	(907) 493-2055
Esther Fayer	City Council Member	City of Togiak	(907) 493-2096
Carrie Burkes	City Council Member	City of Togiak	(907) 891-0011
Cora Martin	City Council Member	City of Togiak	(907) 493-6060
Maya Geltzer	Togiak Resident	Community	(907) 493-6379
Nellie Thomas	City Council Member	City of Togiak	(907) 493-2693
Shawn Kamkahpak	City	City of Togiak	(907) 493-5820
Patrick LeMay, PE	Planner/Consultant	LeMay Engineering & Consulting, Inc.	(907) 250-9038

NAME	TITLE	ORGANIZATION	PHONE
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John Farr, EIT	Planner/Consultant	LeMay Engineering & Consulting, Inc.	(907) 250-9038
Brent Nichols, CFM	State Hazard Mitigation Officer	DHS&EM	(907) 428-7085

Plan Research

This HMP Update was developed using existing Togiak plans and studies as well as outside information and research. The following list contains the most significant of the plans, studies, and websites that were used in updating this HMP. A complete list of references used to develop this plan is in the Bibliography.

1. *Alaska State Hazard Mitigation Plan*. Prepared by and for DHS&EM. October 2013.
2. *Department of Commerce, Community, and Economic Development (DCCED) Division of Community and Regional Affairs (DCRA) Community Information*: https://www.commerce.alaska.gov/web/dcra/communityinformation.aspx.
3. *It's a Disaster! And what are you gonna do about it?* Prepared by the Immediate Action Workgroup, March 4, 2008.
4. Federal Emergency Management Agency (FEMA) How-to Guides:
    a. *Getting Started: Building Support for Mitigation Planning* (FEMA 386-1).
    b. *Local Multi-Hazard Mitigation Planning Guidance*, July 1, 2008 (FEMA 386-8).
    c. *Understanding Your Risks: Identifying Hazards and Estimating Losses* (FEMA 386-2).
    d. *Developing the Mitigation Plan: Identifying Mitigation Actions and Implementing Strategies* (FEMA 386-3).
    e. *Bringing the Plan to Life: Implementing the Hazard Mitigation Plan* (FEMA 386-4).
    f. *Using Benefit-Cost Review in Mitigation Planning* (FEMA 386-5).
5. *Togiak Multi-Hazard Mitigation Plan*. Prepared by the City of Togiak, WHPacific, and Bechtol Planning & Development. October 2009.
6. University of Alaska, Fairbanks (UAF), and Alaska Earthquake Information Center (AEIC) website at: http://earthquake.alaska.edu/.
7. United States Geological Survey (USGS) Earthquake Probability Mapping: www.usgs.gov.
8. West Coast and Alaska Tsunami Warning Center, National Oceanic and Atmospheric Administration (NOAA), http://wcatwc.arh.noaa.gov/.

General Hazard Planning Web Sites

American Planning Association: http://www.planning.org

Association of State Floodplain Managers:	http://www.floods.org
Federal Emergency Management Agency:	http://www.fema.gov
Community Rating System:	http://www.fema.gov/national-flood-insurance-program-community-rating-system
Flood Mitigation Assistance Program:	https://www.fema.gov/flood-mitigation-assistance-grant-program
Hazard Mitigation Grant Program:	http://www.fema.gov/hazard-mitigation-grant-program
Individual Assistance Program:	http://www.fema.gov/individual-assistance-program-tools
Interim Final Rule:	https://www.fema.gov/media-library/assets/documents/4590
National Flood Insurance Program:	http://www.fema.gov/national-flood-insurance-program
Public Assistance Program:	http://www.fema.gov/public-assistance-local-state-tribal-and-non-profit

Public Involvement

Table 2 provides information regarding public involvement during the update of the Togiak HMP.

Table 2. Public Involvement Mechanisms

Mechanism	Description
Newsletter #1 Distribution (December 2017)	In December 2017, the City of Togiak distributed a newsletter describing the upcoming planning activity. The newsletter encouraged the community to provide hazard and critical facility information and to attend the December 14 Planning Team meeting. The newsletter was posted in public locations throughout the community.
Planning Team Meeting #1 (December 14, 2017)	The Planning Team held a public meeting to review hazard profiles and critical infrastructure in the previous HMP, identify new hazards, and discuss the status of mitigation actions that were included in the 2009 HMP.
Newsletter #2 Distribution (February 2018)	In February 2018, the City of Togiak distributed a newsletter encouraging the community to review the Draft HMP and provide feedback and to

Mechanism	Description
	attend the second Planning Team meeting. The newsletter was posted in public locations throughout the community.
Planning Team Meeting #2 (February 27, 2018)	The Planning Team held its second public meeting to review the Draft HMP Update and gather public feedback as to how the HMP Update may be revised to best meet the needs of the community. The meeting included a slide presentation on the plan that resulted in constructive discussions about mitigation activities that the community is undertaking.

Invitations were extended to the community to participate in the 2017/2018 planning process via Project Newsletters #1 and 2 that described the planning update process and announced the upcoming public meetings.

The Planning Team held their first public meeting on December 14, 2017. During the meeting, the Planning Team confirmed the hazards identified in development of the 2009 HMP remain the same in nature and intensity: flood/erosion, severe weather, earthquake, volcano, and added climate change as a fifth hazard.

Following the hazard screening process, the Planning Team reviewed and updated the list of critical facilities in the 2009 HMP. LeMay Engineering & Consulting, Inc. also described the specific information needed from the Planning Team and public to update the risk assessment.

After the community asset data was collected by the Planning Team over the winter of 2017/2018, an updated risk assessment was completed that illustrated the assets that are exposed and vulnerable to specific hazards. Mitigation actions were also reviewed—no new actions were added; however, updates on each mitigation action were provided.

At the second meeting on February 27, 2018, the Planning Team and the public reviewed the Draft HMP Update for accuracy – ensuring it met the community's needs.

Comments were incorporated into the Draft HMP Update before submission of the HMP Update to DHS&EM and FEMA. The City Council approved and adopted the HMP Update for implementation into their community on TBD.

Appendix A includes public involvement documentation such as newsletters, trip reports, meeting sign-in sheets, and presentations.

Plan Implementation

The City Council of Togiak will be responsible for adopting the Togiak HMP Update and all future updates or changes. This governing body has the authority to promote sound public policy regarding hazards. The HMP Update will be assimilated into the Togiak Comprehensive Plan and document as it comes up for review according to the plan's review schedule. The updated Comprehensive Plan will address restrictions in building in identified hazard areas.

Table 3. Togiak Plans

Document	Completed	Next Review
Togiak Comprehensive Plan	2006	Unscheduled
Togiak Emergency Plan		Unscheduled
Togiak Healthy Community Plan		Unscheduled

Monitoring, Evaluating, and Updating the Plan

Section §201.6(c)(4)(i) of the mitigation planning regulation requires that the plan maintenance process shall include a section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.

Monitoring the Plan

The Togiak City Administrator or their designee is responsible for monitoring the HMP. On an annual basis, the City Administrator will implement and update the mitigation projects described in Chapter 4 as funding becomes available. Appendix E contains the necessary forms. Completed forms will be provided to the City Council as information and noticed to the public. Public comments will be sought on mitigation actions that are working, those that aren't, and actions needing to be added.

Evaluating the Plan

The Togiak City Administrator or their designee will evaluate this HMP Update during the five-year cycle of the plan. On an annual basis, the evaluation should assess, among other things, whether:

- The goals and objectives address current and expected conditions.
- The nature, magnitude, and/or types of risks have changed.
- The current resources are appropriate for implementing the mitigation projects in Chapter 4.
- There are implementation problems, such as technical, political, legal or coordination issues.
- The outcomes have occurred as expected (a demonstration of progress).
- The agencies and other partners participated as originally proposed.

Updating the Plan

The mitigation planning regulations in §201.6(d)(3) direct the update of HMPs.

HMPs must be updated and resubmitted to FEMA for approval every five years in order to continue eligibility for FEMA hazard mitigation assistance programs. Updates to the HMP must demonstrate that progress has been made in the past five years to fulfill commitments outlined in the previously approved plan. This involves a comprehensive review and update of each section of the plan and a discussion of the results of evaluation and monitoring activities described above. Plan updates may validate the information in the previously approved plan or may involve a major plan rewrite. A plan update may not be an annex to this plan; it must stand on its own as a complete and current plan.

The tasks required to monitor, evaluate, and update the HMP are illustrated in Figure 1.

Continued Public Involvement

A copy of the HMP will be kept at the City Office and will be available for public review. The City will also distribute natural hazard surveys at the annual Spring Clean-Up event (see Appendix E). Completed surveys received regarding the HMP will be collected by the City Administrator and will be considered during future HMP updates.

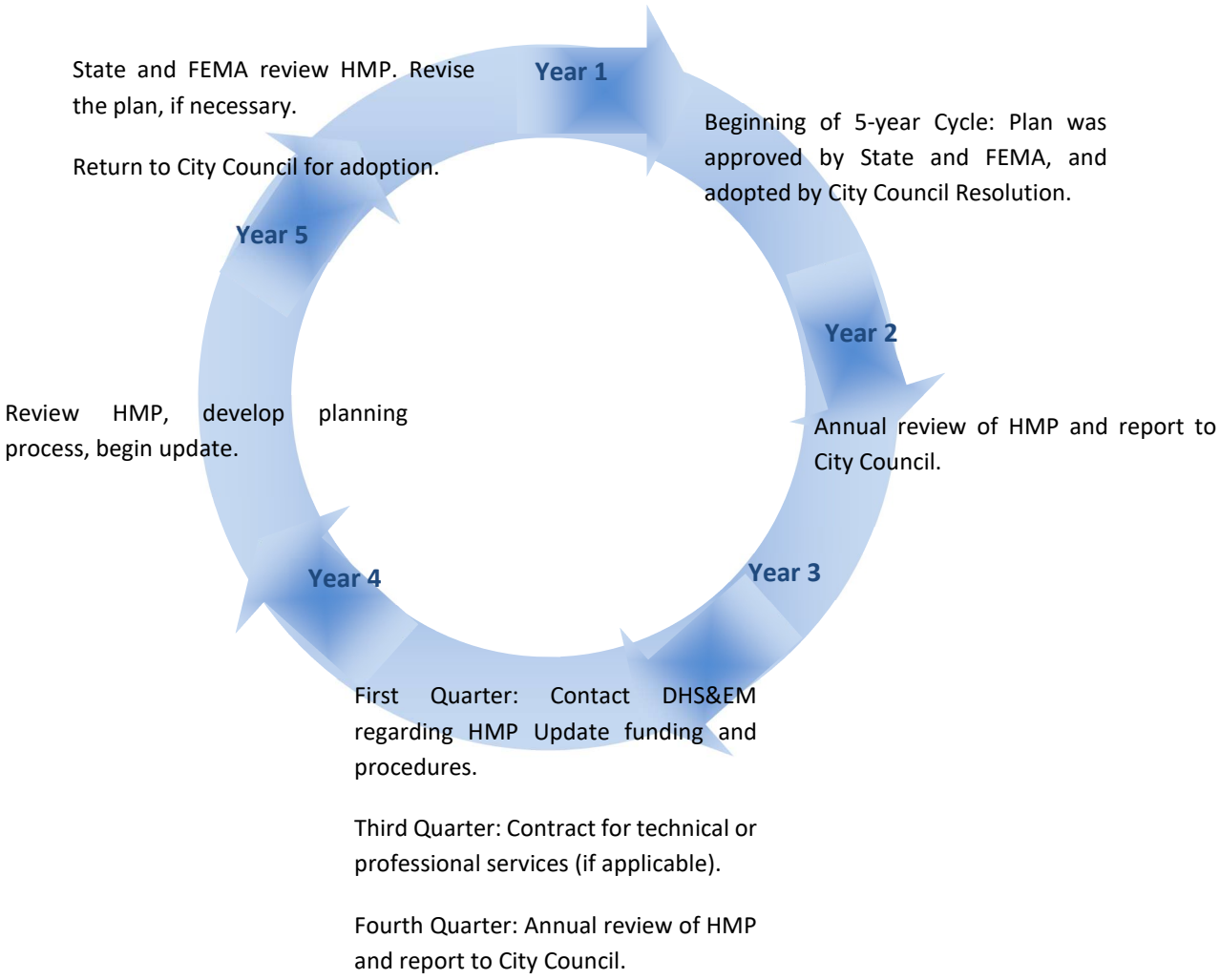


Figure 1. Hazard Mitigation Planning Cycle

Chapter 2. Community Profile

Community Overview

Current Population: 893 (2016 DCCED certified population)

Pronunciation: TOAG-ee-ack

Incorporation Type: 2ND Class City

Borough: Unorganized

Census Area: Dillingham

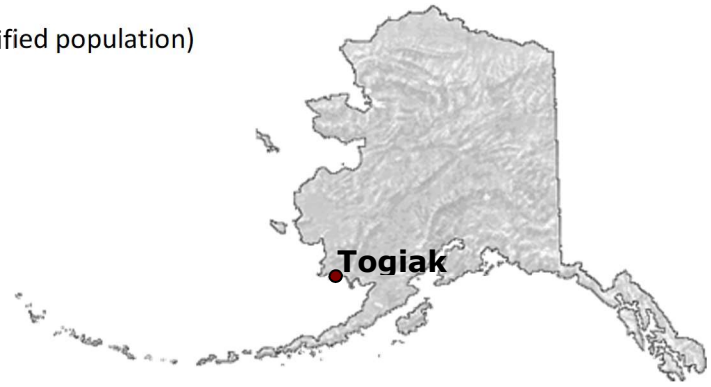


Table 4 provides local and regional contact information for Togiak.

Table 4. Community Information

Community Information	Contact Information
City of Togiak	City of Togiak Darryl Thompson, City Administrator P.O. Box 190 Togiak, AK 99678 Phone: (907) 493-5820 Fax: (907) 493-5067 E-mail: cityoftogiak@outlook.com
Borough Located In:	Unorganized
Electric Utility	Alaska Village Electric Co-Operation (AVEC) 4831 Eagle St. Anchorage, AK 99503 Phone: (907) 567-1818 Fax: (907) 562-4086
School District	Southwest Region School District David Piazza, Superintendent 574 Kenny Wren Rd. P.O. Box 90 Dillingham, AK 99576 Phone: (907) 842-5287 Fax: (907) 842-5428 E-Mail: piazzad@swrsd.org Web: http://www.swrsd.org

Location

Togiak is located at the head of Togiak Bay, 67 miles west of Dillingham. It lies within the Togiak National Wildlife Refuge and is the gateway to Walrus Island Game Sanctuary. Togiak lies at approximately 59.06194° north latitude and 160.37639° west longitude. Togiak is located in the Bristol Bay recording district. The area encompasses 45.2 square miles of land and 183.3 square miles of water.

History

Togiak is a Yup'ik Eskimo village on Togiak Bay. In 1880, "Old Togiak," or "Togiagamute," was located across the Bay on the south shore and had a population of 276. Heavy winter snowfalls made wood-gathering difficult at Old Togiak. Gradually, people settled at a new site on the opposite shore to the north. After a devastating influenza epidemic in 1918, residents of the Yukon-Kuskokwim Delta region migrated to the Togiak area. In 1950, a school was established in an old church. In 1959, a school building and a National Guard Armory were constructed. A flood in 1964 destroyed fish racks and oil storage tanks. After the flood, three or four households left Togiak and developed the village of Twin Hills.

Culture

Togiak is a traditional Yup'ik Eskimo village with a fishing and subsistence lifestyle. The sale and importation of alcohol are prohibited.

Population

According to the 2016 DCCED Certified Population, Togiak has a population of 893; of which nearly 81% are Alaska Native. According to the 2010 U.S. Census, Togiak has a total of 261 housing units; 231 units are occupied and 30 are vacant. The population in 2010 was 817 and incresed to 893 by 2016. Figure 2 provides historical census data.

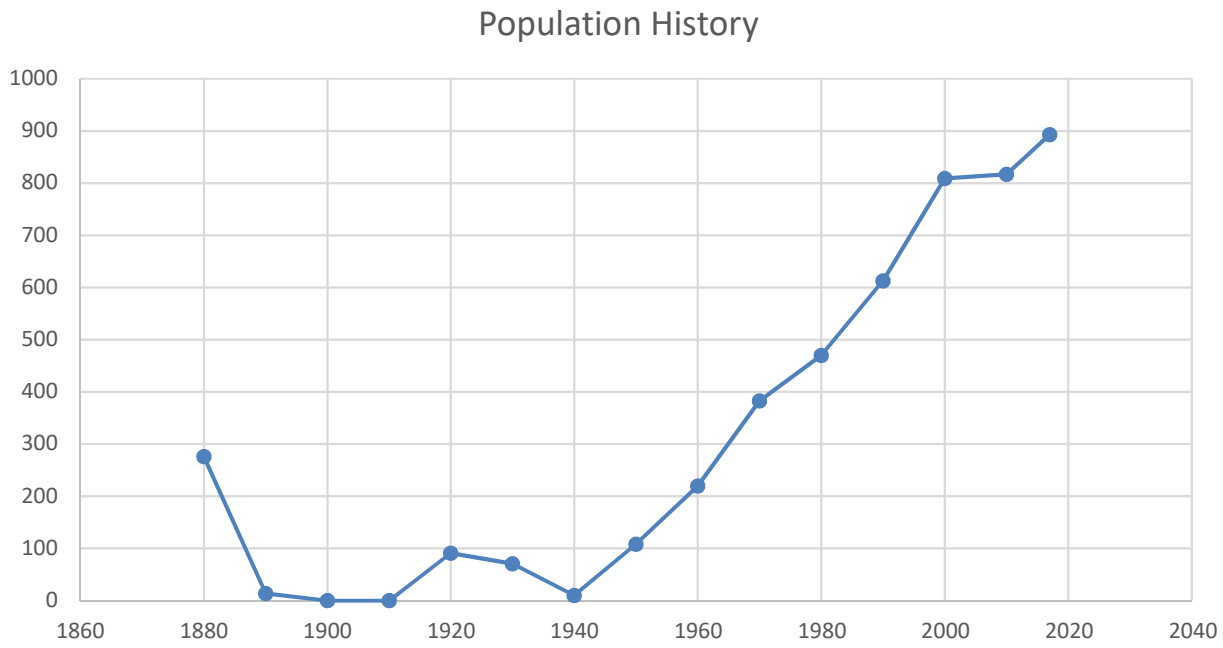


Figure 2. Historical Population

Economy

Togiak's potential work force is 587. A total of 296 residents were employed in 2015; 291 adult residents are not in the labor force (not seeking work). The unemployment rate is 27%. Approximately 22% of Togiak residents live below the poverty line. The per capita income is $12,907, and the median household income is $47,083.

Facilities

Water is pumped from a well, treated, stored, and piped to 88% of community households. Approximately 58% of households are connected to the City sewage system. The water and sewer systems were installed in 1976 and are in need of repair. Refuse is taken to a class-three landfill operated by the City and North Pacific Processors. AVEC operates a 1,673-kilowatt diesel generator.

The Togiak School is part of the Southwest Region School District. The current school was built in 2004 and had 213 students taught by 18 teachers during the 2016-2017 school year.

Togiak is classified as an isolated town, and emergency services have coastal and air access. The community has the Togiak Sub-Regional Health Clinic.

Transportation

Scheduled and chartered flights provide passenger and freight service from Dillingham to Togiak. The community has a state-owned 4,400-foot-long by 98-foot-wide lighted gravel airstrip and a 1,200-foot-long by 49-foot-wide crosswind airstrip. There are no docking facilities; freight arriving by barge is lightered to shore. Skiffs, automobiles, all-terrain vehicles, and snowmobiles are used for local transportation.

Climate

Togiak is located in a climatic transition zone, characterized by tundra interspersed with boreal forests, and weather patterns of long, cold winters and shorter, warm summers. Temperature and precipitation records for this HMP were taken from the Dillingham weather station, located 60 miles east of Togiak, as there was a more complete temperature and precipitation dataset available. Average summer temperatures range from 45.7 to 60.6 degrees Fahrenheit (°F). Winter temperatures average from 9.3°F to 21.9°F. Winters are characterized by fog and high winds. The community has an average of 25 inches of precipitation and an average of 83 inches of snow annually. The Bay is ice-free from June through mid-November.

Vegetation and Soils

Area geology is composed of a low-lying coastal plain characterized by unconsolidated alluvial and marine sediments with localized glacial drift deposits. The deposits are silt, sand, and gravel overlain with volcanic ash (Selkregg, 1976). Togiak is underlain by a series of beach ridge deposits. Inland, the terrain is flat and muskeg-covered, with irregularly-shaped morainal deposits (Bristol Environmental & Engineering Services Corporation, 2003).

The regional vegetation consists of moist tundra characterized by a variety of grasses, sedges, mosses, berries, and low-shrub mires.

Wildlife

According to the U.S. Fish and Wildlife Service, sockeye, chum, pink, and coho salmon and 27 other fish species can be found in Togiak's rivers and streams. An estimated 201 staging, migrating, or breeding bird species are also commonly found in the area. Terrestrial mammals including brown bear, moose, caribou, wolves, and many smaller mammals are also common to the area. Seventeen species of marine mammals are found along the coastline, including stellar sea lions, fur seals, and walrus.

Togiak Capability Assessment

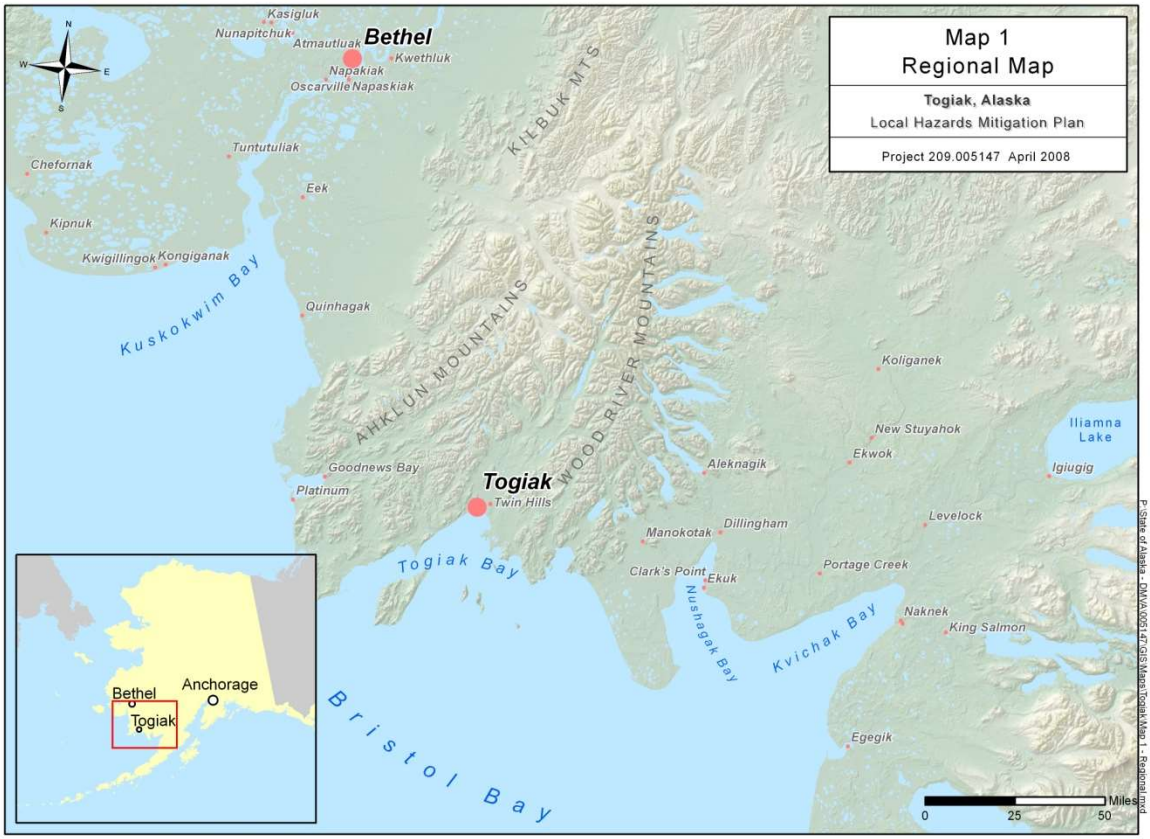
Government

The City of Togiak was incorporated in 1969. The municipal government is composed of six council members and a "strong mayor." Regular elections are held on the first Tuesday in October. The City Council meets on the second Tuesday of each month. The City has a 2% sales tax.

Community Maps

Community maps were developed using data from the DCCED website and input from residents. Togiak participates in the National Flood Insurance Program (NFIP); Togiak's Flood Insurance Rate Maps (FIRMs) became effective on February 3, 2010. Togiak's location in the Bristol Bay area and its relation to the state as a whole is shown on Map 1.

Map 1. Regional Map



Infrastructure

Every jurisdiction is unique. The list of assets that are most important to protect, as well as the criticality of any given facility, can vary widely from community to community. For planning purposes, a jurisdiction should determine criticality based on the relative importance of its various assets for the delivery of vital services, the protection of special populations, and other important functions. Infrastructure may be considered critical for a variety of reasons. The following are examples of facilities important to Togiak.

Critical Facilities

Critical facilities are those facilities and infrastructure necessary for emergency response efforts and whose loss of function would present an immediate threat to life, public health, and safety. In Togiak, they include:

- Airport
- Clinic/Senior Center
- City Office
- Police/Fire Station
- Water Tank

Essential Facilities

Essential facilities are those facilities and infrastructure that supplement response efforts and whose loss of function would present an immediate threat to life, public health, and safety, including:

- Bulk Fuel Storage Tank Farms
- Public Works Complex
- AVEC Electric Plant
- AC Store

Critical Infrastructure

Critical infrastructure consists of the various service networks in Togiak, including:

- Telephone Lines
- Satellite Communication Tower
- Power Lines
- Transportation Networks
- Water Storage and Distribution Network
- Wastewater Collection and Distribution Facilities

Vulnerable Populations

Locations within Togiak that serve populations with special needs or require special consideration include:

- Schools
- Clinic/Senior Housing
- Youth Center
- Traditional Council Senior Center

Cultural and Historical Assets

Cultural and historical assets include those facilities that augment or help define community character that, if lost, would represent a significant loss to the community. These include:

- Nangucuilnguq Arts and Crafts Center
- Togiak Church
- Cemetery

- Moravian Church

Togiak's critical infrastructure is shown on Map 2a and b.

Map 2. Critical Facilities

Federal Resources

The Federal government requires Local governments to have a HMP in place to be eligible for funding opportunities through FEMA, such as through the Pre-Disaster Mitigation Grant (PDMG) Assistance

Program and the Hazard Mitigation Grant Program (HMGP). The Mitigation Technical Assistance Programs available to local governments are also a valuable resource. FEMA may also provide temporary housing assistance through rental assistance, mobile homes, furniture rental, mortgage assistance, and emergency home repairs. The Disaster Preparedness Improvement Grant also promotes educational opportunities with respect to hazard awareness and mitigation.

FEMA, through its Emergency Management Institute, offers training in many aspects of emergency management, including hazard mitigation. FEMA has also developed a large number of documents that address implementing hazard mitigation at the local level. Five key resource documents are available from the FEMA Publication Warehouse (1-800-480-2520) and are briefly described below:

- **How-to Guides.** FEMA has developed a series of how-to guides to assist states, communities, and tribes in enhancing their hazard mitigation planning capabilities. The first four guides mirror the four major phases of hazard mitigation planning used in the development of the Togiak HMP. The last five how-to guides address special topics that arise in hazard mitigation planning such as conducting cost-benefit analysis and preparing multi-jurisdictional plans. The use of worksheets, checklists, and tables make these guides a practical source of guidance to address all stages of the hazard mitigation planning process.
- **Post-Disaster Hazard Mitigation Planning Guidance for State and Local Governments.** FEMA Disaster Assistance Policy-12, September 1990. This handbook explains the basic concepts of hazard mitigation and shows state and local governments how they can develop and achieve mitigation goals within the context of FEMA's post-disaster hazard mitigation planning requirements. The handbook focuses on approaches to mitigation, with an emphasis on multi-objective planning.
- **Mitigation Resources for Success CD.** FEMA 372, September 2001. This CD contains information about mitigation and is useful for State and Local government planners and other stakeholders in the mitigation process. It provides mitigation case studies, success stories, information about Federal mitigation programs, suggestions for mitigation measures to homes and businesses, appropriate relevant mitigation publications, and contact information.
- **A Guide to Federal Aid in Disasters.** FEMA 262, April 1995. When disasters exceed the capabilities of State and Local governments, the President's disaster assistance program (administered by FEMA) is the primary source of federal assistance. This handbook discusses the procedures and processes for obtaining this assistance and provides a brief overview of each program.
- **The Emergency Management Guide for Business and Industry.** FEMA 141, October 1993. This guide provides a step-by-step approach to emergency management planning, response, and recovery. It also details a planning process that businesses can follow to better prepare for a wide range of hazards and emergency events. This effort can enhance a business's ability to recover from financial losses, loss of market share, damages to equipment, and product or business interruptions. This guide could be of great assistance to Togiak businesses.

Other Federal Resources include:

- **Department of Agriculture.** Assistance provided includes: Emergency Conservation Program, Non-Insured Assistance, Emergency Watershed Protection, Rural Housing Service, Rural Utilities Service, and Rural Business and Cooperative Service.
- **Department of Energy, Office of Energy Efficiency and Renewable Energy, Weatherization Assistance Program.** This program minimizes the adverse effects of high energy costs on low-income, elderly, and handicapped citizens through client education activities and weatherization services such as an all-around safety check of major energy systems, including heating system modifications and insulation checks.
- **Department of Housing and Urban Development, Office of Homes and Communities, Section 108 Loan Guarantee Programs.** This program provides loan guarantees as security for federal loans for acquisition, rehabilitation, relocation, clearance, site preparation, special economic development activities, and construction of certain public facilities and housing.
- **Department of Housing and Urban Development, Community Development Block Grants.** Administered by the Alaska DCCED DCRA. Provides grant assistance and technical assistance to aid communities in planning activities that address issues detrimental to the health and safety of local residents, such as housing rehabilitation, public services, community facilities, and infrastructure improvements that would primarily benefit low- and moderate-income persons.
- **Department of Labor, Employment and Training Administration, Disaster Unemployment Assistance.** Provides weekly unemployment subsistence grants for those who become unemployed because of a major disaster or emergency. Applicants must have exhausted all benefits for which they would normally be eligible.
- **Federal Financial Institutions.** Member banks of the Federal Deposit Insurance Corporation or Federal Home Loan Bank Board may be permitted to waive early withdrawal penalties for Certificates of Deposit and Individual Retirement Accounts.
- **Internal Revenue Service, Tax Relief.** Provides extensions to the current year's tax return, allows deductions for disaster losses, and allows amendment of previous tax returns to reflect loss back to three years.
- **United States Small Business Administration (SBA).** May provide low-interest disaster loans to individuals and businesses that have suffered a loss due to a disaster. Requests for SBA loan assistance should be submitted to the Alaska DHS&EM.

The following are websites that provide focused access to valuable planning resources for communities interested in sustainable development activities.

- **FEMA,** http://www.fema.gov – includes links to information, resources, and grants that communities can use in planning and implementation of sustainable measures.
- **American Planning Association,** http://www.planning.org – is a non-profit professional association that serves as a resource for planners, elected officials, and citizens concerned with planning and growth initiatives.

- **Institute for Business and Home Safety,** http://ibhs.org – an initiative of the insurance industry to reduce deaths, injuries, property damage, economic losses, and human suffering caused by natural disasters. Online resources provide information on natural hazards, community land use, and ways citizens can protect their property from damage.

State Resources

- **Alaska DHS&EM** is responsible for coordinating all aspects of emergency management for the State of Alaska. Public education is one of its identified main categories for mitigation efforts.

  Improving hazard mitigation technical assistance for local governments is a high priority item for the State of Alaska. Providing hazard mitigation training, current hazard information, and the facilitation of communication with other agencies would encourage local hazard mitigation efforts. DHS&EM provides resources for mitigation planning on their website at http://www.ready.alaska.gov.

- **DCCED DCRA:** Provides training and technical assistance on all aspects of the NFIP and flood mitigation.
- **Division of Senior Services:** Provides special outreach services for seniors, including food, shelter, and clothing.
- **Division of Insurance:** Provides assistance in obtaining copies of policies and provides information regarding filing claims.
- **Department of Military and Veteran's Affairs:** Provides damage appraisals and settlements for Veterans Administration insured homes and assists with filing for survivor benefits.

Local Resources

Togiak is a small community with a limited number of planning and land management tools. The resources available in Togiak have been assessed by the City and are summarized in Table 5, 6, and 7.

Table 5. Regulatory Tools

Regulatory Tools (ordinances, codes, plans)	Local Authority (Yes/No)	Comments (Year of most recent update; problems administering it, etc.)
Building code	No	Except for NFIP requirements
Zoning ordinance	No	
Subdivision ordinance or regulations	No	May have covenants through Tribal government
Special purpose ordinances (floodplain management, storm water management, hillside or steep slope ordinances, wildfire ordinances, hazard setback requirements)	Yes	Related to NFIP
Growth management ordinances (also called "smart growth" or anti-sprawl programs)	No	
Site plan review requirements	No	Except for those required by specific grant funding, etc.
Comprehensive plan	Yes	2006

Regulatory Tools (ordinances, codes, plans)	Local Authority (Yes/No)	Comments (Year of most recent update; problems administering it, etc.)
A capital improvements plan	Yes	1985 (Comprehensive Plan serves as update)
An economic development plan	Yes	Needs update
An emergency response plan	Yes	
A post-disaster recovery plan	No	
Real estate disclosure requirements	No	

Table 6. Administrative and Technical Capability

Staff/Personnel Resources	Y/N	Department/Agency and Position
City Administrator	Yes	
City Clerk	Yes	
Fire Chief	Yes	Department of Public Safety
City Planner	No	
Public Works Director	Yes	Water/Sewer Director
Public Safety Director	Yes	Police Chief
Librarian		School
Fire Department	Yes	Department of Public Safety
Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	No	
Planners or Engineer(s) with an understanding of natural and/or human-caused hazards	No	
Floodplain manager	No	State
Surveyors	No	
Staff with education or expertise to assess the community's vulnerability to hazards	No	
Personnel skilled in GIS and/or HAZUS	No	

Table 7. Fiscal Capability

Financial Resources	Accessible or Eligible to Use (Yes or No)
Community Development Block Grants	Yes
Capital improvements project funding	Yes
Authority to levy taxes for specific purposes	Yes
Fees for sewer	Yes

Impact fees for homebuyers or developers for new developments/homes	No
Incur debt through general obligation bonds	No
Incur debt through special tax and revenue bonds	No
Incur debt through private activity bonds	No
Withhold spending in hazard-prone areas	Yes

Other Funding Sources and Resources

- **Real Estate Business.** Real estate disclosure is required by State law for properties within flood plains.
- **American Red Cross.** Provides for the critical needs of individuals such as food, clothing, shelter, and supplemental medical needs. Provides recovery needs such as furniture, home repair, home purchasing, essential tools, and some bill payment.
- **Crisis Counseling Program.** Provides grants to State and Borough mental health departments, which in turn provide training for screening, diagnosing, and counseling techniques. Also provides funds for counseling, outreach, and consultation for those affected by disaster.

Chapter 3. Risk Assessment

Requirements

> Section 201.6(c)(2) of the mitigation planning regulation requires local jurisdictions to provide sufficient hazard and risk information from which to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards (FEMA 386-8).

The goal of mitigation is to reduce the future impacts of a hazard including loss of life, property damage, and disruption to local and regional economies, environmental damage and disruption, and the amount of public and private funds spent to assist with recovery.

Mitigation efforts begin with a comprehensive risk assessment. A risk assessment measures the potential loss from a disaster event caused by an existing hazard by evaluating the vulnerability of buildings, infrastructure, and people. It identifies the characteristics and potential consequences of hazards and their impact on community assets.

Federal Requirements for Risk Assessment

Federal regulations for HMPs outlined in 44 CFR Section §201.6(c)(2) include a requirement for a risk assessment. This risk assessment requirement is intended to provide information that will help the community identify and prioritize mitigation activities that will prevent or reduce losses from identified hazards. The Federal criteria for risk assessments and information on how this HMP Update meets those criteria are outlined below.

Table 8. Risk Assessment - Federal Requirements

Section §201.6(c)(2) Requirement	Where requirement is addressed in Togiak HMP
Identifying Hazards §201.6(c)(2)(i) The risk assessment *shall* include a description of the type . . . of all natural hazards that can affect the jurisdiction . . .	Chapter 3, Section 1 identifies **flood/erosion, severe weather, earthquakes, volcanoes, and climate change** as natural hazards affecting Togiak.
Profiling Hazards §201.6(c)(2)(i) The risk assessment *shall* include a description of the . . . location and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.	Chapter 3, Sections 3-7 include hazard-specific sections of the Togiak HMP that profile the natural hazards that may affect the community. The HMP includes **location, extent, impact,** and **probability** for each natural hazard identified. The HMP also provides hazard-specific information on **previous occurrences**.
Assessing Vulnerability: Overview §201.6(c)(2)(i) The risk assessment *shall* include a description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the community.	Chapter 3, Sections 3-7 contain overall summaries of each hazard. The vulnerabilities for the community are contained in hazard-specific sections in Chapter 3.

Section §201.6(c)(2) Requirement	Where requirement is addressed in Togiak HMP
Assessing Vulnerability: Addressing Repetitive Loss Properties §201.6(c)(2)(ii) The risk assessment in all plans approved after October 1, 2008 must also address NFIP insured structures that have been repetitively damaged.	The City of Togiak participates in the NFIP. Chapter 3, Section 3, Flood/Erosion, explains this requirement in further detail.
Assessing Vulnerability: Identifying Structures §201.6(c)(2)(ii)(A) The plan *should* describe vulnerability in terms of the types and number of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas.	Chapter 3, Section 2, Table 14 lists structures, infrastructure, and critical facilities located in the identified hazard areas.
Assessing Vulnerability: Estimating Potential Losses §201.6(c)(2)(ii)(B) The plan *should* describe vulnerability in terms of an estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(ii)(A) of this section and a description of the methodology used to prepare the estimate.	Chapter 3, Section 2, Table 15 estimates potential dollar losses to municipal-owned facilities. This information was derived from insurance values provided by the City.
Assessing Vulnerability: Land Uses and Development Trends §201.6(c)(2)(ii)(C) The plan should describe vulnerability in terms of providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.	Chapter 3, Section 2, Land Use and Development Trends Subsection contains this information.

Vulnerability Assessment Methodology

Risk assessment typically consists of three components: hazards identification, vulnerability assessment, and risk analysis.

1. Hazards identification – The first step in conducting a risk assessment is to identify and profile hazards and their possible effects on the jurisdiction. This information can be found in Chapter 3: Identifying Hazards, Overview.
2. Vulnerability Assessment – The second step is to identify the jurisdiction's vulnerability: the people, infrastructure, and property that are likely to be affected. It includes everyone who enters the jurisdiction including employees, shoppers, tourists, and others.

   Populations with special needs such as children, the elderly, and the disabled should be considered.

   Inventorying the jurisdiction's assets to determine the number of buildings, their value, and

population in hazard areas can also help determine vulnerability. A jurisdiction with many high-value buildings in a high-hazard zone will be extremely vulnerable to financial devastation brought on by a disaster event.

Identifying hazard-prone critical facilities is vital because these facilities are necessary during response and recovery phases.

Critical facilities include:

- Essential facilities, which are necessary for the health and welfare of an area and are essential during response to a disaster, including medical facilities, fire stations, police stations, and other emergency facilities;
- Transportation systems, such as highways, airways, and waterways;
- Utilities, water treatment plants, communication systems, and power facilities;
- High-potential loss facilities, such as bulk fuel storage facilities;
- Hazardous materials sites; and
- Other items to identify critical facilities include economic elements, areas that require special considerations, historic, cultural and natural resource areas, and other jurisdiction-determined important facilities.

3. Risk Analysis – The next step is to calculate the potential losses to determine which hazard will have the greatest impact on the jurisdiction. Hazards should be considered in terms of their frequency of occurrence and potential impact on the jurisdiction. For instance, a possible hazard may pose a devastating impact on a community but have an extremely low likelihood of occurrence. Such a hazard must take lower priority than a hazard with only moderate impact but a very high likelihood of occurrence.

   For example, there might be several schools exposed to one hazard but one school may be exposed to four different hazards. A multi-hazard approach will identify such high-risk areas and indicate where mitigation efforts should be concentrated.

The purpose of a vulnerability assessment is to identify the assets of a community that are susceptible to damage in the event of a hazard incident. Critical facilities are described in the Community Profile Section of this HMP. A vulnerability table of critical facilities as affected by each hazard is provided in Section 2 of this chapter.

Facilities were designated as critical if they are: (1) vulnerable due to the type of occupant (children or elderly, for example); (2) critical to the community's ability to function (roads, power generation facilities, water treatment facilities, etc.); (3) have a historic value to the community (cemetery); or (4) critical to the community in the event of a hazard occurring (emergency shelter, etc.).

The assessment includes the following eight sections:

Section 1. Identifying Hazards

Section 2. Assessing Vulnerability: Overview and Potential Losses

Section 3. Flood/Erosion

Section 4. Severe Weather

Section 5. Earthquake

Section 6. Volcano

Section 7. Climate Change

Section 8. Hazards Not Profiled in the 2018 Togiak HMP

The description of each of the identified hazards includes a narrative, and in some cases, a map of the following information:

- The **location** or geographical areas in the community that would be affected.
  The location of identified hazards is described by a map wherever appropriate or in some cases with a narrative statement.
- The **extent** (i.e. magnitude or severity) of potential hazard events is determined.
  Table 9 is used to rank the extent of each hazard. Sources of information to determine the extent include the 2013 *Alaska State Hazard Mitigation Plan,* historical or previous occurrences, and information from local residents and experts.

Table 9. Extent of Hazard Ranking

Magnitude/Severity	Criteria to Determine Extent
Catastrophic	Multiple deaths Complete shutdown of facilities for 30 or more days More than 50% of property severely damaged
Critical	Injuries and/or illnesses result in permanent disability Complete shutdown of critical facilities for at least two weeks More than 25% of property is severely damaged
Limited	Injuries and/or illnesses do not result in permanent disability Complete shutdown of critical facilities for more than one week More than 10% of property is severely damaged
Negligible	Injuries and/or illnesses are treatable with first aid Minor quality of life lost Shutdown of critical facilities and services for 24 hours or more Less than 10% of property is severely damaged

- The **impact** of the hazard or its potential effects on the community is described.
- The **probability** that the hazard event would occur in an area.

Table 10, taken from the 2013 *Alaska State Hazard Mitigation Plan*, categorizes the probability of a hazard occurring. Sources of information to determine the probability include the 2013 *Alaska State Hazard Mitigation Plan*, historical or previous occurrences and information from experts, as well as local residents.

Table 10. Probability Criteria Table

Probability	Criteria Used to Determine Probability
4 - Highly Likely	Event is probable within the calendar year. Event has up to 1 in 1 year's chance of occurring (1/1=100%). History of events is greater than 33% likely per year. Event is "Highly Likely" to occur.
3 - Likely	Event is probable within the next three years. Event has up to 1 in 3 year's chance of occurring (1/3=33%). History of events is greater than 20% but less than or equal to 33% likely per year. Event is "Likely" to occur.
2 - Possible	Event is probable within the next five years. Event has up to 1 in 5 year's chance of occurring (1/5=20%). History of events is greater than 10% but less than or equal to 20% likely per year. Event could "Possibly" occur.
1 - Unlikely	Event is possible within the next 10 years. Event has up to 1 in 10 year's chance of occurring (1/10=10%). History of events is less than or equal to 10% likely per year. Event is "Unlikely" but is possible of occurring.

- **Previous occurrences** of hazard events.

  The previous occurrences of natural events are described for identified natural hazards. The information was obtained from the 2013 *Alaska State Hazard Mitigation Plan,* the 2016 State Disaster Cost Index, City records, other state and federal agency reports, newspaper articles, and web searches, etc.

Section 1. Identifying Hazards

This section identifies and describes the hazards with the potential to affect Togiak. The community used the following sources to identify the hazards present in the community: the 2013 *Alaska State Hazard Mitigation Plan*, interviews with experts and long-time residents, and previous occurrences of events.

Alaska State Hazard Mitigation Plan, 2013 Matrices – Bristol Bay Borough

Table 11 is taken from the *Alaska State Hazard Mitigation Plan* of October 2013. The identification of hazards is for the Bristol Bay Borough, as a whole, and is not specific to Togiak; some hazards, such as erosion, are documented as present in Togiak but are not identified on this matrix.

Table 11. Hazard Matrix

Hazard Matrix – Bristol Bay Borough				
Flood	**Wildland Fire**	**Earthquake**	**Volcano**	**Avalanche**
Y-L	N	Y-L	Y-L	Y-L
Tsunami & Seiche	**Severe Weather**	**Ground Failure**	**Erosion**	
N	Y-M	N	N	

Hazard Identification:

Y: Hazard is present in jurisdiction but probability unknown.

Y-L: Hazard is present with a low probability of occurrence within the next 10 years. Event has up to 1 in 10 year's chance of occurring.

Y-M: Hazard is present with a moderate probability of occurrence within the next three years. Event has up to 1 in 3 year's chance of occurring.

Y-H: Hazard is present with a high probability of occurrence within the next one year. Event has up to 1 in 1 year's chance of occurring.

N: Hazard is not present.

Data for the Previous Occurrences Matrix in Table 12 comes from the 2013 *Alaska State Hazard Mitigation Plan*, the 2016 Disaster Cost Index that includes data from 1978 to 2016, and major events such as the 1964 earthquake. It may not include events known to the community or from other sources discussed in the sections describing specific hazards.

Table 12. Previous Occurrences from 1978 to Present

Previous Occurrences - Bristol Bay Borough				
Flood	**Wildland Fire**[1]	**Earthquake**[2]	**Volcano**	**Avalanche**
2 – L	2-L	None	None	1 – L
Tsunami & Seiche	**Severe Weather**	**Ground Failure**	**Erosion**	
None	5 – L	None	None	

Extent

L - Limited – Minimal through maximum impact to part of community. *Falls short of the definition for total extent*.

Number:

Number of occurrences

Identification of Natural Hazards Present in Togiak

Based on consultation with the Alaska DHS&EM, Table 11 and 12 from the 2013 *Alaska State Hazard Mitigation Plan*, plans and reports for Togiak, and interviews, Togiak identified the following hazards to be profiled.

Table 13. Hazards Identification and Decision to Profile

Hazard	Yes/No	Decision to Profile Hazard
Earthquake	Yes	Designated as a hazard in the 2013 *Alaska State Hazard Mitigation Plan*, the AEIC indicated that Togiak lies near active earthquake faults.
Flood/Erosion	Yes	Flood/Erosion is designated as a hazard in the 2013 *Alaska State Hazard Mitigation* Plan; erosion is documented in U.S. Army Corps of Engineers (USACE) studies, and residents report previous occurrences.
Severe Weather	Yes	Designated as a hazard in 2013 *Alaska State Hazard Mitigation Plan*. Previous occurrences have caused damage in the community.
Volcano	Yes	The Alaska Volcano Observatory (AVO) identifies the closest active volcano to Togiak as being Mount Redoubt, approximately 200 miles away; however, closer inactive volcanoes exist, and Redoubt activity could cut off access to other parts of the state.
Climate Change	Yes	Designated as a statewide hazard.
Avalanche	No	Togiak's topography is not conducive to avalanches.
Ground Failure	No	Not designated as a hazard in the 2013 *Alaska State Hazard Mitigation Plan*.
Tsunami	No	The bathymetry and shallow depth of Togiak Bay protect the City from a tsunami.
Wildland Fire	No	Not designated as a hazard in the 2013 *Alaska State Hazard Mitigation Plan*.

[1] Burning more than 5 acres.

[2] Magnitude 5.0 or greater.

See Section 8, Hazards Not Profiled in the 2018 Togiak HMP, for more information on the hazards not profiled in this plan. Each hazard that affects the community is profiled in hazard-specific sections.

Photo courtesy of the City of Togiak.

Section 2. Assessing Vulnerability

Overview

The vulnerability overview section is a summary of Togiak's vulnerability to the hazards identified in Table 13. The summary includes: type of hazard, the types of structures, infrastructures, and critical facilities affected by the hazards. Some hazards are area-wide in scope while others impact certain areas of the community to a greater or lesser extent.

Identification of Assets

The Hazard Vulnerability Matrix in Table 14 includes a list of facilities, utilities, and businesses and whether, based on its location, each has a low (L), medium (M), or high (H) vulnerability to specific natural hazards. The table corresponds to Maps 2a and 2b, Critical Facilities.

Table 14. Hazard Vulnerability Matrix – Structures and Infrastructure

Structure	Flood/Erosion	Severe Weather	Volcano	Earthquake	Climate Change
Airport	L	H	L	L	L
City Office	H	H	L	L	L
Water Tank	L	H	L	L	L
Police/Fire Station	H	H	L	L	L
Clinic/Senior Center	L	H	L	L	L
School Complex	H	H	L	L	L
UUI Station	L	H	L	L	L
Fuel Storage Tanks (22 tanks at 30,000 gallons each)	L	H	L	L	L
AVEC Electric Plant	H	H	L	L	L
AVEC Tank Farm	H	H	L	L	L
Landfill	L	H	L	L	L
AC Store	H	H	L	L	L
Beacon Tower	L	H	L	L	L
UAF BB & Youth Center	L	H	L	L	L
Nanguciulnguk Center	L	H	L	L	L
Coupchiak Building	L	H	L	L	L

Table 15 lists the critical facilities owned by the City and the replacement value of buildings and contents. Both of these values were provided by the City and were based on insurance assessments. Additional information will be added as it becomes available.

Table 15. City-owned Critical Facilities with Replacement Value

Structure	Building Value ($)	Contents Value ($)
City Office (Community Center)	$563,985	$45,324
City Shop	$235,438	$33,993
Water Tank	$1,200,000	
New Pump House	$47,557	
Police/Fire Station	$835,385	$29,460
Clinic/Senior Center	$1,985,095	
School Complex	$27,000,000	
UUI Station		
Fuel Storage Tanks (22 tanks at 30,000 gallons each)	$11,000,000	
AVEC Electric Plant	$7,000,000	
Landfill Storage Building	$106,651	$21,345
AC Store		
Beacon Tower		
Water Treatment Plant	$4,500,000	$5,666
Family Resource Center	$1,400,000	$80,000
Manifold Building	$31,995	$12,807
Gray House	$92,552	$1,133
Craft Center	$829,668	
Old School (used as community center)	$10,000,000	
Southern Baptist Training Center	$3,000,000	
Moravian Church	$1,500,000	

Exposure Analysis

Flood and Erosion

The community is affected by coastal erosion along Togiak Bay and riverine bank erosion along Nasaurluq Creek, which is in the northern part of the community. It is assumed that 30% of the City (approximately 268 people in approximately 79 residences located in areas historically prone to flooding erosion) could be affected.

The City of Togiak is an NFIP participant, and no repetitive losses have occurred. Impacts to future populations, residences, critical facilities, and infrastructure are anticipated at the same impact level.

Impacts from erosion include loss of land and any development on that land. Erosion can cause increased sedimentation of harbors and river deltas and hinder channel navigation, reduction in water quality due to high sediment loads, loss of native aquatic habitats, damage to public utilities (docks, harbors, electric, and water/wastewater utilities), and economic impacts associated with costs trying to prevent or control erosion sites. In the City of Togiak, only the location of a building can lessen its vulnerability to erosion.

Severe Weather

Using information provided by the City of Togiak and the NWS, the entire existing and future City of Togiak population, residences, and critical facilities are equally exposed to the effects of a severe weather event. For this Exposure Analysis, it is assumed that 30% of the population and residential/commercial structures (approximately 268 people in 79 residences) could be affected.

Impacts associated with severe weather events can include roof collapse, trees and power lines falling, damage to light aircraft, sinking of small boats, injury and death resulting from snow machine or vehicle accidents, and overexertion while shoveling. A quick thaw after a heavy snow can also cause substantial flooding. Impacts from extreme can cold include hypothermia, halting transportation from fog and ice, congealed fuel, frozen pipes, disruption in utilities, and carbon monoxide poisoning. Buildings that are older and/or not constructed with materials designed to withstand heavy snow and wind (e.g., hurricane ties on crossbeams) are more vulnerable to the impacts of severe weather.

Impacts to future populations, residences, critical facilities, and infrastructure are anticipated at the same impact level. To lessen future impacts, the City could institute and enforce building codes to accommodate the effects of severe weather on structures.

Volcanic Ash

The Togiak area can expect to experience volcanic ash fall depending on the wind direction. For this Exposure Analysis, it is assumed that 10% of the population and residential/commercial structures (approximately 89 people in 21 residences) could be affected.

Impacts to future populations, residential structures, critical facilities, and infrastructure are anticipated at the same historical impact level.

Earthquake

The Togiak area can expect to experience limited earthquake ground movement that may result in infrastructure damage. Intense shaking may be seen or felt based on past events. Although all structures are exposed to earthquakes, buildings within the community constructed with wood have slightly less vulnerability to the effects of earthquakes than those with masonry.

Based on earthquake probability (PGA) maps produced by the USGS, the entire area is not at risk of experiencing significant earthquake impacts as a result of its close proximity to known earthquake faults.

The probability is limited in that impacts to the community such as “severe” ground movement may result in infrastructure damage and personal injury.

For this Exposure Analysis, it is assumed that 10% of the population and residential/commercial structures (approximately 89 people in 21 residences) could be affected.

Impacts to future populations, residential structures, critical facilities, and infrastructure are anticipated at the same historical impact level.

Climate Change

Impacts to the community from Climate Change may affect the entire Togiak area. For this Vulnerability Analysis, it is assumed that 10% of the population and residential/commercial structures (approximately 89 people in 21 residences) could be affected.

Land Use and Development Trends

Planned future construction in Togiak includes additional housing in the Togiak Heights subdivision. This area is above the floodplain and is not vulnerable to flooding and erosion hazards; however, the development in this more wooded area may increase susceptibility to wildfire or other hazards. At the time of the 2018 update, the City was in the final stages of relocation and consolidation of utility generators and tank farms, which are located above the base flood elevation, and a number of roadway improvement projects. Other potential projects include construction of a sub-regional healthcare facility, new public safety facilities, and an electrical intertie with the community of Twin Hills. These are all planned for areas above the 100-year floodplain. The community's vulnerability to hazards has remaind approximately the same because additional funding is necessary to implement all mitigation strategies with the exception of public outreach.

Section 3. Flood and Erosion

The flood/erosion hazard profile includes a description of the hazard, the location, extent, impact and probability of the hazard, and previous occurrences of flooding/erosion (not due to tsunami, which is covered in Section 8) in Togiak.

Hazard Description

The primary flooding and erosion hazard in Togiak is storm surge flooding. Togiak is located on the coast, and therefore, is susceptible to significant storm surge flooding. The effects of climate change are expected to add to natural hazards including flooding in coastal areas. As the sea level rises and the offshore ice pack retreats, more coastal flooding can be expected. Storm-driven wind and waves, high tides, heavy rains, and flooding contribute to coastal erosion in Togiak. Additionally, Togiak is subject to riverine bank erosion along Nasaurluq Creek in the northern part of the community. Heavy rains and spring snowmelt cause flooding in Togiak that damages infrastructure and hampers movement throughout the community.

Storm surge: Storm surges or coastal floods occur when the sea is driven inland above the high-tide level onto land that is normally dry. Often, heavy surf conditions driven by high winds accompany a storm surge, adding to the destructive floodwater's force. The conditions that cause coastal floods can also cause significant shoreline erosion as the flood waters undercut roads and other structures. Storm surge is a leading cause of property damage in Alaska.

The meteorological parameters conducive to coastal flooding are low-atmospheric pressure, strong winds (blowing directly onshore or along the shore with the shoreline to the right of the direction of the flow), and winds maintained from roughly the same direction over a long distance across the open ocean (fetch).

Communities that are situated on low-lying coastal lands with gradually-sloping bathymetry near the shore and exposure to strong winds with a long fetch over the water are particularly susceptible to coastal flooding. Several communities and villages along the Bristol Bay coast, the Bering Sea coast, the Arctic coast, and the Beaufort Sea coast have experienced significant damage from coastal floods over the past several decades. Most coastal flooding occurs during the late summer or early fall season in these locations. As shore-fast ice forms along the coast before winter, the risk of coastal flooding abates.

Coastal erosion: Coastal erosion is the wearing a way of coastal land. It is commonly used to describe the horizontal retreat of the shoreline along the ocean. Erosion is considered a function of larger processes of shoreline change, which includes erosion and accretion. Erosion results when more sediment is lost along a particular shoreline than is redeposited by the water body. Accretion results when more sediment is deposited along a particular shoreline than is lost. When these two processes are balanced, the shoreline is said to be stable. In assessing the erosion hazard, it is important to realize that there is a temporal (time dependent) aspect associated with the average rate at which a shoreline is either eroding or accreting. Over a long-term period (years), a shoreline is considered to be eroding, accreting, or stable. A hazard evaluation should focus on the long-term erosion situation. However, in the short-term, it is important to understand that storms can erode a shoreline that is, over the long-term, classified as accreting, and vice versa.

Riverine erosion: Riverine erosion is the long-term process whereby river banks and riverbeds are worn away. This erosion is often initiated by river bank failure or heavy rainfall increasing the sediment loads. As the sediment load increases, fast-flowing rivers will erode their banks downstream. Eventually, the river becomes overloaded or velocity is reduced, leading to sediment deposition further downstream or in dams and reservoirs. The deposition may eventually lead to the river developing a new channel.

Erosion is measured as a rate, with respect to either a linear retreat (i.e., feet of shoreline recession per year) or volumetric loss (i.e., cubic yards of eroded sediment per linear foot of shoreline frontage per year). Erosion rates are not uniform, and vary over time at any single location. Annual variations are the result of seasonal changes in wave action and water levels.

Erosion is caused by coastal storms and flood events; changes in the geometry of tidal inlets, river outlets, and bay entrances; man-made structures and human activities such as shore protection structures and dredging; long-term erosion; and local scour around buildings and other structures. Further information on coastal erosion can be found in FEMA-55, Coastal Construction Manual, FEMA's Multi-Hazard Identification and Risk Assessment, Evaluation of Erosion Hazards published by The Heinz Center, and Coastal Erosion Mapping and Management, a special edition of the Journal of Coastal Research (FEMA, 386-2).

Location

The community is affected by coastal erosion along Togiak Bay and riverine erosion along Nasaurluq Creek, which is in the northern part of the community.

During high tides, water rises as much as 22 feet in the fall and winter. High winds are also prevalent, with winds up to 80 knots that raise water levels another five feet, inundating substantial portions of the community. Residents stated that storm surges, resulting from high winds and high-water levels, cause flooding in the Togiak Spit and the old townsite. The low, flat terrain areas along the coast are most at risk of storm surge flooding. Flooding also occurs when seawater enters the slough and inundates the community from the river side.

Snowmelt during spring break-up, as well as heavy rains, cause flooding throughout the community, leaving roads impassable and hamper movement between critical facilities and residences. This is shown in the photo on the right. A snow-blower was secured from the State to assist in removal of snow from streets. This reduces the amount of snow that is amassed and reduces standing water during breakup.

Photo courtesy of the City of Togiak.

Map 3 was taken from the *Alaska Baseline Erosion Assessment* (USACE, 2009) and depicts the linear extent of erosion in Togiak.

Map 3. Linear Extent of Erosion in Togiak, Alaska

Source: *Alaska Baseline Erosion Assessment, 2009*

Extent

The extent (i.e. magnitude or severity) of the flood/erosion hazard is measured in this HMP by using historical past events and the 2013 *Alaska State Hazard Mitigation Plan*. Based on these factors and using the criteria established in Table 9, the City of Togiak has a **critical** flooding and erosion extent. Flooding and erosion along the shoreline have been a persistent problem with major flood/erosion events in 1964, 1979, 1980, 1982 and 2005. Critical extent is defined as: injuries and/or illnesses result in permanent disability; complete shutdown of critical facilities for at least two weeks; and/or more than 25% of property is severely damaged.

The most recent FIRMs became effective in February 2010. A flood gauge was installed on the front of the City office. A High-Water Elevation sign was placed on the gauge with the water symbol at the 1964 flood level of 18.8 feet.

The unprotected coastal areas and the expanding community area south of the seawall are being eroded (USACE, 2009). The rate of erosion was estimated at about one foot per year (Tetra Tech, 1983). That same report estimated that erosion could increase to seven to eight feet per year if major storms occur

regularly. In 2010, the City estimated the rate of coastal erosion to be four feet per year and the rate of erosion along Nasaurluq Creek to be four to six feet per year.

Impact

Most of the community's public and private buildings are located near the coastline. Flooding in the coastal portions of Togiak could cut off access to critical facilities and services. Ninety percent of the village was flooded under water as deep as three to four feet during the 1964 flood event.

Erosion along Nasaurluq Creek reportedly threatens residences, outbuildings, sheds, water lines, sewer lines, and a church. Some of these structures are less than 100 feet from the eroding bank. Locally-installed erosion protection measures include a line of 55-gallon drums filled with rocks approximately 30 feet inland from the bank. The City dumps rock and gravel on the creek side of the 55-gallon drums when needed (USACE, 2009). The City completed approximately 3 million dollars of improvements to the City's seawall to further prevent erosion by improving the old seawall.

Even properties unaffected directly by flood events, will suffer due to road closures, impacts to public safety (access and response capabilities), and isolation.

Probability

Based on the 2013 *Alaska State Hazard Mitigation Plan*, City records, and past historical events, Togiak has a **likely** probability of flooding. Table 10 defines criteria used for determining probability as the hazard is present with a probability of occurrence within the next three years. The event has up to 1 in 3 year's chance of occurring (33%). The 2013 *Alaska State Hazard Mitigation Plan* lists Togiak (Bristol Bay Borough) as having a flood hazard present but with a low probability.

However, heavy winter snowfall and rapid spring thaws that have occurred create conditions for flooding in the community on a regular basis.

Previous Occurrences

The community of Togiak flooded in 1964. The flood waters reached levels of 18.8 feet. The City also experienced flooding in 2005 that resulted in the following disaster declaration:

06-214 2005 Bristol Bay Storm (AK-06-214) declared October 03, 2005 by Governor Murkowski: On August 23, 2005, a strong storm with high winds combined with high tides produced storm surges of two to three feet above the high tide levels and caused **widespread coastal flooding in the upper Bristol Bay** area. Public infrastructure, commercial property, and personal property damages were reported in the City of Clark's Point, the nearby unincorporated community of Ekuk, and the **City of Togiak**. Clark's Point and **Togiak** signed local disaster declarations and asked for state Individual Assistance and Public Assistance in response and recovery from this storm. Individual Assistance totaled $131,890 for 39 applicants. Public Assistance totaled $157,000. The total for this disaster was $326,000 (RBS, Nov 7, 2008).

Community Participation in the NFIP

The City of Togiak participates in the NFIP. Togiak is an emergency phase community; this is the initial phase of a community's participation; only limited amounts of insurance are available.

The function of the NFIP is to provide flood insurance at a reasonable cost to homes and businesses located in floodplains. As a participant in the NFIP, the City of Togiak agrees to regulate new development and substantial improvement to existing structures in the floodplain, or to build safely above flood heights to reduce future damage to new construction. The program is based on mapping areas of flood risk and requiring local implementation to reduce flood damage primarily through requiring the elevation of structures above the base (100-year) flood elevations (BFE). Table 16 describes the FIRM zones.

Table 16. FIRM Zones

Firm Zone	*Explanation*
A	Areas of 100-year flood; BFEs and flood hazard not determined.
AO	Areas of 100-year shallow flooding where depths are between one and three feet, average depths of inundation are shown but no flood hazard factors are determined.
AH	Areas of 100-year shallow flooding where depths are between one and three feet; BFEs are shown but no flood hazard factors are determined.
A1-A30	Areas of 100-year flood; BFEs and flood hazard factors determined.
B	Areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood.
C	Areas of minimal flooding.
D	Areas of undetermined, but possible, flood hazards.

Development permits are required by the City for all new building construction, or substantial improvements, in A, AO, AH, and A-numbered Zones. Flood insurance purchase may be required in flood zones A, AO, AH, and A-numbered zones as a condition of loan or grant assistance. An Elevation Certificate is required as part of the development permit. The Elevation Certificate is a form published by FEMA required to be maintained by communities participating in the NFIP. According to the NFIP, local governments maintain records of elevations for all new construction or substantial improvements in floodplains and keep the certificates on file.

Elevation Certificates are used to:

- Record the elevation of the lowest floor of all newly-constructed buildings, or substantial improvement, located in the floodplain.
- Determine the proper flood insurance rate for floodplain structures.

Local governments must insure that elevation certificates are completed correctly for structures built in floodplains. Certificates must include:

- The location of the structure (tax parcel number, legal description, and latitude and longitude) and use of the building.

- The FIRM panel number and date, community name, and source of BFE date.
- Information on the building's elevation.
- Signature of a licensed surveyor or engineer.

Table 17 provides current NFIP statistics for the City of Togiak, while Table 18 provides contact information for local and state floodplain coordinators. It should be noted that the City of Togiak has submitted **zero** claims.

Table 17. Current NFIP Statistics

Emergency Program Date Identified	**Regular Program Entry Date**	**Map Revision Date**	**NFIP Community Number**	**CRS Rating Number**	**Total # of Current Policies (11/30/17)**
05/10/1977	05/21/2009	02/03/2010	020090	-	2
Total Premiums	**Total Loss Dollars Paid**	**Average Value of Loss**	**AK State # of Current Policies**	**AK State Total Premiums**	**AK Total Loss Dollars Paid**
$894	$9,711,985.03	$15,319	2,493	$2.2 million	$9.7 million
Togiak Average Premium	**AK State Average Premium**	**Repetitive Loss Claims**	**Dates of Rep. Losses**	**Total Rep. Loss**	**Average Rep. Loss**
$852	$893	0	0	$0	$0

Table 18. State Floodplain Coordinator Contact Information

State of Alaska Floodplain Coordinator	Floodplain Management Programs Coordinator Division of Community and Regional Affairs Department of Commerce, Community & Economic Development Contact Person: Jimmy C. Smith 550 West 7th Avenue, Suite 1640 Anchorage, AK 99501 Phone: (907) 269-4132 E-Mail: jimmy.smith@alaska.gov Web: https://www.commerce.alaska.gov/web/dcra/PlanningLandManagement/FloodplainManagement.aspx

Flood and Erosion Mitigation Goals and Projects

Flood and Erosion Mitigation Goals

Goal 1. Reduce or prevent future flood damage.

Perform mitigation actions that will reduce floodwater incursion into the community and will make structures less vulnerable to damage.

Goal 2. Reduce loss of life or injuries from flood disasters.

Provide safe access to emergency shelter during all weather conditions and flood events.

Goal 3. Increase public awareness.

Increase public knowledge about mitigation opportunities, floodplain functions, emergency service procedures, and potential hazards.

Flood and Erosion Mitigation Projects

See Table 20 for further analysis of specific projects to mitigate flooding and erosion.

FLD-1. Bulkhead Rehabilitation. (Goal 1)

The community reported that the creek by the bulkhead has eroded nearly two feet of material away, and the bulkhead has started to lean toward the water. Consider lengthening the seawall to the southwest. Coordination with the USACE is needed on this project.

2018 update: This project remains a high priority project. Approximately $3 million in repairs to the 1984-86 project were completed in 2017. The City is seeking funding for further protection measures.

FLD-2. Elevation and/or reinforcement of roads. (Goal 1)

Elevate and reinforce roads that serve as barriers to rising waters or storm surges. Main roads throughout town have been identified as performing this function. A flood/dust abatement grant was secured to begin this process.

2018 update: The City has $125,000 from the Bureau of Indian Affairs (BIA) to be utilized to elevate and reinforce roads. This project is currently entering the design phase as the City surveys the amount of material necessary to raise the roads. The BIA funds are for projects FLD-2 and FLD-4. More funding may be necessary to complete these projects.

FLD-3. Relocate existing and new public safety facilities to areas above the 100-year floodplain. (Goals 1, 2)

Areas have been set aside in the ridge area (near the school and Togiak Heights subdivision) for public safety facilities where they will not be impacted by flood hazards.

2018 update: The cost to relocate existing and new public safety facilities is approximately $2 million. This project has not been completed due to lack of funding.

FLD-4. Emergency shelter access route. (Goal 2)

A second route for access and egress to the school, which is the community's designated shelter, and the Togiak Heights subdivision is needed. It is important that all areas of the community have access to the shelter. A direct route past the pump house is envisioned.

2018 update: As with project FLD-2, the City has $125,000 from BIA to assist in constructing a second route. This project is currently entering the design phase as the City surveys the amount of material necessary to raise the roads and plans to begin work in the summer of 2018. More funding may be necessary to complete this project.

FLD-5. Improve drainage in Togiak. (Goals 1, 2)

Storms and snowmelt both cause flooding in the community. Improved drainage could keep standing water off streets, reducing damage to infrastructure, and facilitating movement of residents and emergency services throughout the community.

2018 update: Drainage improvements have not been completed due to lack of funding; however, the City works to keep snow clear of the lower areas of town to reduce potential for flooding.

FLD-6. Suite of emergency plans. (Goals 2, 3)

To facilitate preparedness, the community's Emergency Operations Plan should be updated and tailored to the community's specific needs. Other emergency plans could include emergency evacuation and continuity of operations planning.

2018 update: This project is currently in progress. The City has a standing agreement with the school bus operator to assist in the evacuation of the town in the event of a flood. Training/drills have been conducted twice with important lessons learned (two people were injured during drills).

FLD-7. Public education. (Goal 3)

Increase public knowledge about mitigation opportunities, floodplain functions, emergency service procedures, and potential hazards. This would include advising property owners, potential property owners, and visitors about potential hazards. In addition, dissemination of a brochure or flyer on flood hazards in Togiak could be developed and distributed to all households.

Hands on educational activities and presentations on flood and erosion at the school can greatly influence families throughout the community.

2018 update: Public education has been minimal; however, the schools implement drills, and students disseminate the information to their family members.

FLD-8. Togiak Flood Plain Maps. (Goal 1, 2)

Accurate flood maps that delineate areas of flooding and upland areas should be prepared.

2018 update: Flood maps were completed. FIRMs for Togiak were effective as of February 2010.

FLD-9: Flood Insurance. (Goals 1, 2)

Continue to obtain flood insurance for all City structures, and continue compliance with the NFIP.

2018 update: This project remains ongoing as the City works to maintain flood insurance and keep in compliance with the NFIP.

Section 4. Severe Weather

Hazard Description

Weather is the result of four main features: the sun, the earth's atmosphere, moisture, and the structure of the planet. Certain combinations can result in severe weather events that have the potential to become a disaster.

In Alaska, there is great potential for weather disasters. High winds can combine with loose snow to produce blizzards, and wind chills can reach temperatures of 75°F below zero. Extreme cold (colder than -40°F) and ice fog may last for weeks at a time. Heavy snow is common along the southern coast. A rapid thaw can mean flooding.

In many Alaskan communities, severe weather can disrupt the delivery of fuel by barge or aircraft. Since residents are generally dependent on fuel for electric power, heat, and other energy needs, this can be disastrous to the community as a whole.

Weather issues in Togiak include high winds, winter storms with blizzard conditions, heavy snow, extreme cold, and ice storms.

Winter Storms

Winter storms originate as mid-latitude depressions or cyclonic weather systems. High winds, heavy snow, and cold temperatures usually accompany them. To develop, they require:

- Cold air - Subfreezing temperatures (below 32°F) in the clouds and/or near the ground to make snow and/or ice.
- Moisture - The air must contain moisture to form clouds and precipitation.
- Lift - A mechanism to raise the moist air to form the clouds and cause precipitation. The following may result in lift:
    - The flow of air up a mountainside.
    - Fronts, where warm air collides with cold air and rises over the dome of cold air.
    - Upper-level low-pressure troughs.

Heavy Snow

Heavy snow, generally more than 12 inches of accumulation in less than 24 hours, can immobilize a community by bringing transportation to a halt. Until the snow can be removed, airports and major roadways are impacted, even closed completely, stopping the flow of supplies and disrupting emergency and medical services. Accumulations of snow can cause roofs to collapse and knock down trees and power lines. Heavy snow can also damage light aircraft and sink small boats. A quick thaw after a heavy snow can cause substantial flooding. The cost of snow removal, repairing damages, and the loss of business can have severe economic impacts on cities and towns. Injuries and deaths related to heavy snow usually occur as a result of vehicle accidents. Casualties also occur due to overexertion while shoveling snow and hypothermia caused by overexposure to the cold weather.

Extreme cold: The definition of an excessively cold temperature varies according to the normal climate of a region. In areas unaccustomed to winter weather, near freezing temperatures are considered "extreme cold". In Alaska, extreme cold usually involves temperatures below –40°F. Extreme cold may accompany winter storms, be left in their wake, or can occur without storm activity.

Extreme cold can bring transportation to a halt for days or sometimes weeks at a time. Aircraft may be grounded due to extreme cold and ice fog conditions, cutting off access as well as the flow of supplies to villages.

Extreme cold also interferes with a community's infrastructure. It causes fuel to congeal in storage tanks and supply lines, stopping electric generation or heating. Without electricity or heating, water and sewer pipes may freeze or rupture. If extreme cold conditions are combined with low or no snow cover, the ground's frost depth can increase, disturbing buried pipes.

The greatest danger from extreme cold is its effect on people. Prolonged exposure to the cold can cause frostbite or hypothermia and become life-threatening. Infants and elderly people are most susceptible. The risk of hypothermia due to exposure greatly increases during episodes of extreme cold. Also, carbon monoxide poisoning is possible as people use supplemental heating devices.

Ice Storms: The term ice storm is used to describe occasions when damaging accumulations of ice are expected during freezing rain situations. They can be the most devastating of winter weather phenomena and are often the cause of automobile accidents, power outages, and personal injury. Ice storms result from the accumulation of freezing rain, which is rain that becomes super-cooled and freezes upon impact with cold surfaces. Freezing rain most commonly occurs in a narrow band within a winter storm that is also producing heavy amounts of snow and sleet in other locations.

Freezing rain develops as falling snow encounters a layer of warm air in the atmosphere deep enough for the snow to completely melt and become rain. As the rain continues to fall, it passes through a thin layer of cold air just above the earth's surface and cools to a temperature below freezing. The drops themselves do not freeze, but rather they become super-cooled. When these super-cooled drops strike the frozen ground, power lines, tree branches, etc., they instantly freeze.

Location

The hazards of severe weather impact Togiak on an area-wide basis. A severe weather event would create an area-wide impact that could damage structures and potentially isolate Togiak from the rest of the state.

Winter blizzards close roads throughout the community as public works staff struggle to keep up with clearing efforts.

Severe weather affecting regional transportation hubs (i.e. Dillingham or Anchorage) also impacts Togiak. Severe weather can ground flights, preventing the transportation of critical goods into the community.

Extent

Severe weather could result in a **critical** situation in Togiak. Injuries and/or illness could result in permanent disabilities from blizzard conditions and high winds, also potentially causing shutdown of

critical facilities for at least two weeks, and/or severely damaging at least 25% of property, and isolating Togiak from the rest of the state.

The 2013 *Alaska State Hazard Mitigation Plan* lists severe weather as creating five limited-damage events in Togiak.

Impact

Severe weather can cut off air access, limiting medevac availability and access to goods and services, including groceries and medical supplies. Severe wind may result in extensive damage to structures including residences and public facilities. In the past, blowing snow in high wind conditions has entered attic/roof space and damaged insulation in several structures.

A severe weather event would have an area-wide impact that could damage structures and critical infrastructure, and potentially isolate Togiak from the rest of the State.

Probability

The Planning Team described severe weather as a serious natural hazard risk in Togiak, due to snow, ice, and high winds. The probability of severe weather in Togiak is **highly likely**, which is defined as the hazard is present with a high probability of occurrence within the calendar year. The event has up to a 1 in 1 year's chance of occurring (100%).

Previous Occurrences

West Coast Storm, November 23, 1979. A major sea storm on the west coast of Alaska caused extensive damage in 14 villages in the area. The Governor proclaimed a Disaster Emergency effective from Sheldon Point to **Togiak**. At the request of the Governor, the SBA authorized disaster loans to affected individuals and businesses, and the State provided grants to individuals and families as well as some public assistance related to a fuel spill in Togiak.

Togiak, February 8, 1991. An electrical failure lasting four days, combined with extreme cold temperatures, caused damage to the Municipal water system and the plumbing and heating systems of public buildings. Disaster assistance supported emergency work and permanent repair work.

2005 Bristol Bay Storm (AK-06-214) was declared October 03, 2005, by Governor Murkowski: On August 23, 2005, a strong storm with high winds combined with high tides produced storm surges of two to three feet above high tide levels and caused widespread coastal flooding in the upper Bristol Bay area. Public infrastructure, commercial property, and personal property damages were reported in the City of Clark's Point, the nearby unincorporated community of Ekuk, and the **City of Togiak**. Clark's Point and **Togiak** signed local disaster declarations and asked for state Individual Assistance and Public Assistance in response and recovery from this storm. Individual Assistance totaled $135,000 for 39 applicants. Public Assistance totaled $157,000 for three applicants. The total for this disaster was $326,000.

Wind event, October 2009. City staff reported that wind gusts up to 80 miles per hour (MPH) occurred in Togiak. Construction crews witnessed a 22-foot by 28-foot house lifted off its support pilings

approximately 10 feet into the air before settling back down. The pilings were damaged, but the house was undamaged. Another structure under construction had a portion of the roof blown off.

AK-15-257, 2015 December Windstorm was declared by Governor Walker on January 29, 2016. On December 24, 2015, a storm moved from the Pribilof Island region in a northeasterly direction to the mainland. The storm damaged the City of **Togiak's** protective sea wall, City dock, power distribution lines, City building roof tops, and residential home roof tops. Subsequent sea surges dislodged road surface material from City roads.

On December 30, 2015, The City of **Togiak's** Mayor, signed a local-disaster emergency declaration, specifically requesting individual disaster relief for homeowners with flooded homes and damaged personal, real, and subsistence property. The declaration also requested public assistance aid for emergency protective measures, technical assistance to evaluate damage, and financial assistance for temporary and permanent repairs to public infrastructure including the sea wall and City water collection and transmission lines. The State damage assessment conducted in partnership with community leadership showed damage to 750 feet of the 1,500-foot-long seawall. Damage included sections that heaved and bowed, as well as the separation of sections from the main wall. Damage to the dock was also evident.

Severe Weather Mitigation Goals and Projects

Severe Weather Mitigation Goals

Goal 1: Mitigate the effects of severe weather.

Encourage weather-appropriate construction and citizen preparedness.

Goal 2: Education and preparedness.

Provide information about the dangers of severe weather and how to prepare.

Goal 3: Develop an early warning system.

Develop a practical method to warn people in the event of a severe weather event.

Severe Weather Mitigation Projects

SW-1. Storm Ready. (Goals 2, 3)

Research and consider instituting the National Weather Service program of *"Storm Ready"*.

Storm Ready is a nationwide community preparedness program that uses a grassroots approach to help communities develop plans to handle all types of severe weather—from tornadoes to tsunamis. The program encourages communities to take a new, proactive approach to improving local hazardous weather operations by providing emergency managers with clear-cut guidelines on how to improve their hazardous weather operations.

To be officially Storm Ready, a community must:

1. Establish a 24-hour warning point and emergency operations center.

2. Have more than one way to receive severe weather forecasts and warnings and to alert the public.

3. Create a system that monitors local weather conditions.

4. Promote the importance of public readiness through community seminars.

5. Develop a formal hazardous weather plan, which includes training severe weather spotters and holding emergency exercises.

6. Demonstrate a capability to disseminate warnings.

Specific Storm Ready guidelines, examples, and applications also may be found on the Internet at: http://www.nws.noaa.gov/stormready.

2018 update: This remains a high priority action. The City fulfills some of the criteria to become a StormReady community but requires further organization to receive the official designation.

SW-2. Education and preparedness activities. (Goal 2)

Conduct special awareness activities, such as Winter Weather Awareness Week, Flood Awareness Week, etc., in the school and with the general public.

2018 update: Progress on this project has been limited; schools have regular drills and information is disseminated from students to their family members.

SW-3. NOAA Weather Radio. (Goal 2)

Expand public awareness about NOAA Weather Radio for continuous weather broadcasts and warning tone alert capability.

2018 update: The City is working to increase the availability of weather updates to the community, but this project has not been fully implemented.

SW-4. Encourage weather-resistant building construction materials and practices. (Goal 1)

Homes, businesses, and public buildings that are built to be weather-resistant have lower maintenance and utility costs, suffer less weather-related damage, and are more comfortable in Alaska's harsh weather.

2018 update: This project remains ongoing. All new construction, including the water plant, sewer lift station, City office, and school is, or will be, built with weather-resistant material.

Section 5. Earthquake

Hazard Description

Approximately 11% of the world's earthquakes occur in Alaska, making it one of the most seismically active regions in the world. Three of the 10 largest quakes in the world since 1900 have occurred in Alaska. Earthquakes of magnitude 7 or greater occur in Alaska on average of about once a year; magnitude 8 earthquakes average about 14 years between events.

Most large earthquakes are caused by a sudden release of accumulated stresses between crustal plates that move against each other on the earth's surface. Some earthquakes occur along faults that lie within these plates. The dangers associated with earthquakes include ground shaking, surface faulting, ground failures, snow avalanches, seiches and tsunamis. The extent of damage is dependent on the magnitude of the quake, the geology of the area, the distance from the epicenter, and the structure design and construction. A main goal of an earthquake hazard reduction program is to preserve lives through economical rehabilitation of existing structures and construct safe new structures.

Ground shaking is due to the three main classes of seismic waves generated by an earthquake: primary, shear, and surface. Primary waves are the first waves felt, often as a sharp jolt. Shear or secondary waves are slower and usually have a side to side movement. They can be very damaging because structures are more vulnerable to horizontal than vertical motion.

Surface waves are the slowest, although they can carry the bulk of the energy in a large earthquake. Damage to buildings depends on how the characteristics of each incoming wave interact with the buildings' height, shape, and construction materials.

Earthquakes are usually measured in terms of their magnitude and intensity. Magnitude is related to the amount of energy released during an event; intensity refers to the effects on people and structures at a particular place. Earthquake magnitude is usually reported according to the standard Richter scale for small to moderate earthquakes.

Large earthquakes are reported according to the moment-magnitude scale because the standard Richter scale does not adequately represent the energy released by these large events.

Intensity is usually reported using the Modified Mercalli Intensity Scale. This scale has 12 categories ranging from not felt to total destruction. Different values can be recorded at different locations for the same event depending on local circumstances such as distance from the epicenter or building construction practices. Soil conditions are a major factor in determining an earthquake's intensity, as unconsolidated fill areas will have more damage than an area with shallow bedrock. Surface faulting is the differential movement of the two sides of a fault.

There are three general types of faulting: strike-slip, normal, and thrust. Strike-slip faults are where each side of the fault moves horizontally. Normal faults have one side dropping down relative to the other side. Thrust (reverse) faults have one side moving up and over the fault relative to the other side.

Earthquake-induced ground failure is often the result of liquefaction, which occurs when soil (usually sand and course silt with high water content) loses strength as a result of the shaking and acts as a viscous fluid.

Liquefaction causes three types of ground failures: lateral spreads, flow failures, and loss of bearing strength. In the 1964 earthquake, over 200 bridges were damaged or destroyed due to lateral spreads. Flow failures damaged the port facilities in Seward, Valdez, and Whittier.

Similar ground failures can result from loss of strength in saturated clay soils, as occurred in several major landslides that were responsible for most of the earthquake damage in Anchorage in 1964. Other types of earthquake-induced ground failures include slumps and debris slides on steep slopes.

Location

An earthquake event could potentially impact any part of Togiak. Since Togiak is dependent on-air transportation for delivery of medical supplies and groceries, damage to regional airports would have serious impacts as well.

Extent

The extent of an earthquake in Togiak could be **limited**. Table 9 uses the following criteria to determine the extent of possible damage: injuries and/or illnesses do not result in permanent disability, complete shutdown of critical facilities for more than one week, and/or more than 10% of property is severely damaged.

Intensity is a subjective measure of the strength of the shaking experienced in an earthquake. Intensity is based on the observed effects of ground shaking on people, buildings, and natural features. It varies from place to place within the disturbed region depending on the location of the observer with respect to the earthquake epicenter.

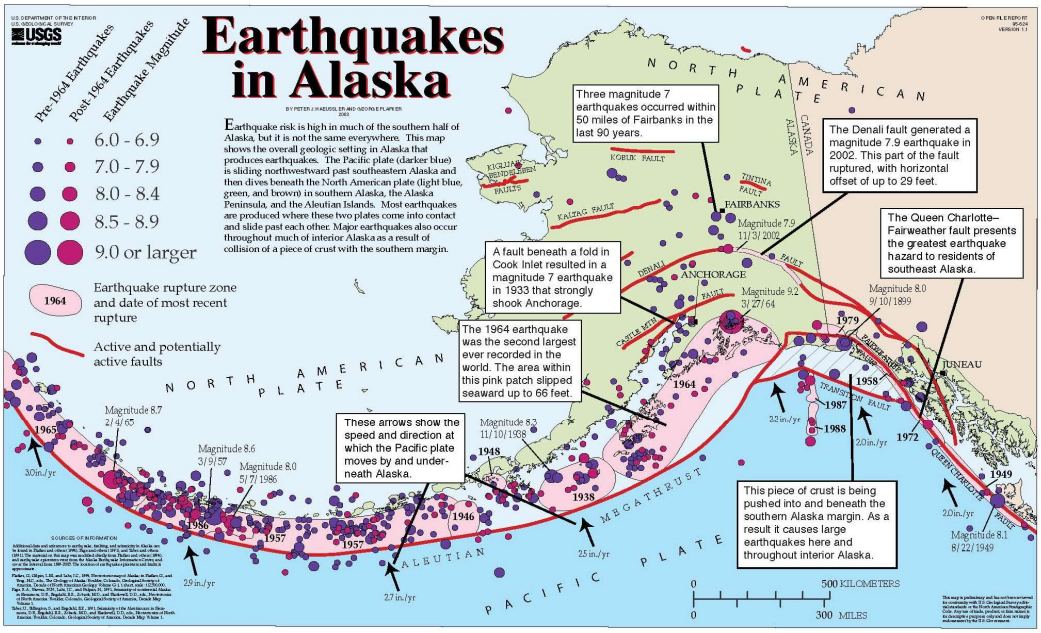
The "intensity" reported at different points generally decreases away from the earthquake epicenter. Local geologic conditions strongly influence the intensity of an earthquake; commonly, sites on soft ground or alluvium have intensities two to three units higher than sites on bedrock.

The Richter scale expresses magnitude as a decimal number. A 5.0 earthquake is a moderate event, a 6.0 characterizes a strong event, a 7.0 is a major earthquake, and a great earthquake exceeds 8.0. The scale is logarithmic and open-ended (*Alaska State Hazard Mitigation Plan,* 2013).

A magnitude of 2.0 or less is called a microearthquake; they cannot even be felt by people and are recorded only on local seismographs. Events with magnitudes of about 4.5 or greater are strong enough to be recorded by seismographs all over the world. The magnitude would have to be higher than 5.0 to be considered a moderate earthquake, and a large earthquake might be rated as magnitude 6.0 and major as 7.0. Great earthquakes (which occur once a year on average) have magnitudes of 8.0 or higher (British Columbia 1700, Chile 1960, and Alaska 1964). The Richter Scale has no upper limit, but for the study of massive earthquakes, the moment magnitude scale is used. The modified Mercalli Intensity Scale is used to describe earthquake effects on structures.

Map 4 shows historic earthquakes in the state of Alaska. The Togiak area has a low probability of earthquake; however, since all of Alaska is at risk for an earthquake event, Togiak could be at risk for an earthquake or have secondary impacts from an earthquake in the region.

Map 4. AEIS Historic Earthquakes in Alaska



Impact

The impact on the community of Togiak from a severe earthquake event occurring near the town site would be limited.

Earthquake damage would be area-wide with potential damage to critical infrastructure and key facilities. Priority would need to be given to critical infrastructure to include: public safety facilities, health care facilities, shelters and potential shelters, and public utilities.

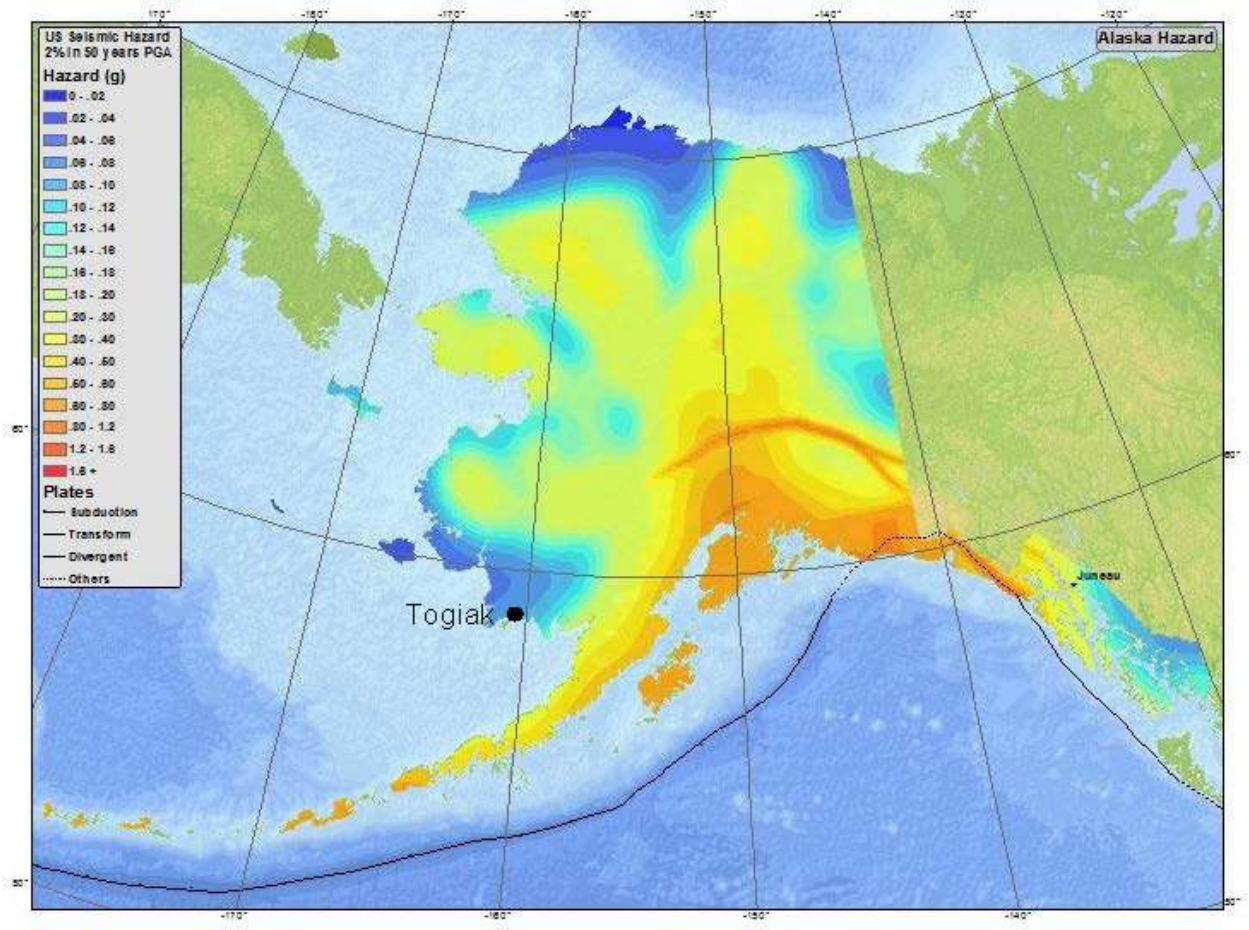
Probability

Togiak has an **unlikely** probability of earthquake hazard. Table 10 lists the following criteria for an unlikely probability: the hazard is present with a low probability of occurrence within the next 10 years. The event has up to 1 in 10 years' (10%) chance of occurring.

While it is not possible to predict an earthquake, the USGS has developed Earthquake Probability Maps that use the most recent earthquake rate and probability models. These models are derived from earthquake rate, location, and magnitude data from the USGS National Seismic Hazard Mapping Project.

Using the USGS map shown in Map 5, Togiak has a 2% probability of a ground acceleration of 0.08 to 0.10 *g* occurring in 50 years.

Map 5. USGS Earthquake Probability



Previous Occurrences

There have been no reports of earthquake damage in Togiak.

From 1957 to June 2017 one earthquake has occurred within 50 kilometers (km) of Togiak with a magnitude of 2.5 or greater. It was a magnitude 4.2 earthquake occurring on May 16, 1992. Its epicenter was located in Bristol Bay, with coordinates of latitude 58.987° north, longitude -160.279° west.

Earthquake Mitigation Goal and Projects

Earthquake Mitigation Goals

Goal 1: Mitigate against earthquake damage.

Obtain funding to protect existing critical infrastructure from earthquake damage.

Earthquake Mitigation Projects

E-1. Identify critical facilities.

Identify buildings and facilities that must be able to remain operable during and following an earthquake event.

2018 update: Seismic retrofits were identified and completed for the following facilities: water plant, sewer lift stations, school, and City office.

E-2: Assess the structural integrity of critical facilities and infrastructure.

Perform an engineering assessment of the earthquake vulnerability of each identified critical infrastructure owned by the City of Togiak.

2018 update: This project was completed in 2014 and accrued approximately $1.8 million in consulting fees.

E-3. Nonstructural Mitigation Projects.

Assess facilities and improve earthquake preparedness through such measures as installing bookshelf tie-downs, improving computer servers' resistance to earthquakes, and moving heavy objects to lower shelves, etc.

2018 update: Nonstructural mitigation projects have been completed at the school.

Section 6. Volcano

Hazard Description

Alaska is home to an average of one to two eruptions per year. Forty historically active volcanoes dot the southern portion of the State from the Wrangell Mountains to the far Western Aleutians.

A volcano is a vent at the Earth's surface through which magma and associated gases erupt, and also the landform built by effusive and explosive eruptions. Volcanoes display a wide variety of shapes, sizes, and behavior; however, they are commonly classified among three main types: cinder cone, composite, and shield.

Cinder Cone Volcanoes: A cinder cone is the simplest type of volcano; they often occur in clusters and produce lava flows. Cinder cone volcanoes are built from particles of congealed lava that are blown into the air, break into small fragments, solidify, and fall as cinders around a single vent to form a circular or oval cone. Most cinder cones are rarely more than 1,000 feet above their surroundings; most have a bowl-shaped crater or crater at the summit. Cinder cones may form as flank vents on the sides or larger composite or shield volcanoes.

Composite Volcanoes: Composite volcanoes, sometimes called stratovolcanoes, are typically steep-sided, symmetrical cones of large dimension built of alternating layers of lava flows, volcanic ash, blocks, and bombs. These volcanoes are built up by accumulated erupted material and increase in size as lava, and fragmented deposits, are added. Composite volcanoes may rise as much as 8,000 feet above their bases and have a principal conduit system through which magma from a reservoir deep in the Earth's crust rises to the surface repeatedly to cause eruptions. The eruptions tend to be explosive because of the viscous magmas common to composite volcanoes; some produce enormous explosive eruptions destroying a large part of the volcano itself, resulting in a wide, roughly circular depression called a caldera. These eruptions are the largest eruptions known.

Shield Volcanoes: Shield volcanoes are formed by lava flowing in all directions from a central summit vent or group of vents, or rift zones building a broad, gently-sloping cone with a dome shape. They are built-up slowly by the accumulation of thousands of highly fluid lava flows that spread widely over great distances, and then cool in thin layers. Some of the largest volcanoes in the world are shield volcanoes.

Volcanic eruptions create the following hazards:

- Lava Flow: streams of molten rock that flow from a volcano; a typical lava flow may extend between six and 30 miles depending on viscosity, volume, slope steepness, and obstructions in the flow path.
- Pyroclastic Flow: high-density mixtures of hot gases and dry rock that are usually released explosively from a volcano. They travel at speeds of 30 to 90+ miles per hour.
- Pyroclastic Surges: turbulent low-density clouds of rock debris, air, and other gases that move over the ground at high speeds. There are two types: hot surges of dry materials over 212˚F and cold surges consisting of cooler rock debris and water or steam.

- Lava Domes: formed when viscous lava erupts slowly from a vent, causing it to solidify near the vent forming a steep-sided rubbly dome instead of flowing away from the vent.
- Volcanic Ash and Bombs: also called tephra, are fine fragments of solidified lava ejected into the air by an explosion of rising hot air. Chronic exposure to ash is a significant public health hazard. Ash also interferes with mechanical equipment, including aircraft and generators.
- Volcanic Gases: consist mostly of steam, carbon dioxide, sulfur dioxide, hydrogen sulfide, and chlorine compounds, but may include other substances. These gases can damage eyes, respiratory systems, and cause suffocation in high concentrations and may be very corrosive.
- Lateral Blasts: inflated mixtures of gases, ash, and hot rock debris that may be hundreds of feet thick and travel up to 370 miles per hour.
- Debris Avalanches: are sudden downward movements of unconsolidated material (mostly rock and soil).
- Lahars and Debris Flows: are rapidly flowing mixtures of rock debris and water that originate on the slopes of a volcano. Primarily formed by the rapid melting of snow and ice by pyroclastic flows, intense rainfall on loose volcanic rock deposits, breakout of lakes dammed by volcanic depositions, and as a consequence of debris avalanches.

The community of Togiak is located near the Togiak Volcanics and 40 miles south of Flat Top Mountain Volcano. The Togiak Volcanics are a set of thin lava flows underlying the Togiak River valley (AVO, 2009). The Togiak Volcanics and Flat Top Mountain Volcano are inactive.

Ingakslugwat Hills volcanic field is the closest active volcano that consists of 32 small cinder cones and eight larger craters located approximately 200 miles north of Togiak (AVO, 2009). Ingakslugwat Hills is currently an unmonitored volcanic field.

Mt. Redoubt Volcano is an active, steep-sided cone stratovolcano; the most recent active vent is located on the north side of the crater (AVO, 2009). Redoubt Volcano is ranked as “normal” by the National Volcano Early Warning System. Mt. Redoubt may not pose a direct threat to Togiak, but it is in the flight path from Togiak to Anchorage, which is a regional transportation hub.

Photo by Suzanne Taylor

Mount Redoubt during a 2009 eruption.

Regional airport facilities are of particular concern since the community is dependent on-air transportation for delivery of medical supplies and groceries.

Location

Volcanic eruption hazards could potentially impact any part of Togiak. It is possible for Togiak to be impacted by ashfall from active volcanoes in the southcentral portion of the state depending on which direction the wind is blowing, which could pose a threat to public health.

Extent

The extent of volcanic eruption hazards in Togiak could be **limited**. Table 9 uses the following criteria to determine the extent of possible damage: injuries and/or illnesses would not result in permanent disability; complete shutdown of critical facilities for more than one week; and/or more than 10% of property is severely damaged.

If there was an eruption in the area near Togiak, ash would be the main hazard; other possible hazards could include volcanic gases.

Impact

The impact on the community of Togiak resulting from a volcanic eruption event occurring near the City would be limited.

Volcanic ash fall is a regional hazard. Ash is gritty, abrasive, and acidic. Heavy ash fall reduces visibility and may create sudden electrical power demands resulting in brownouts. Ash may cause machine failure and contaminate or clog water supplies. Accumulation of ash may cause structural collapse and fine ash is slippery, making both walking and driving hazardous. Ash can cause respiratory irritation, and in extreme cases, respiratory failure, especially among infants, elderly, and those with respiratory ailments (Mason, et al., 1997).

Probability

The probability of a volcanic eruption event is considered **likely.** Table 10 lists the following criteria for a likely event: hazard is present with a probability of occurrence with the next three years. The event has up to 1 in 3 years' (33%) chance of occurring.

Previous Occurrences

There have been no reports of volcano eruption-related damage in Togiak.

Volcano Mitigation Goals and Projects

Volcano Mitigation Goals

Goal 1: Mitigate against volcano damage.

Volcano Mitigation Projects

V-1. Public Education and Preparedness.

Coordinate with aviation entities to share information and advanced warning of volcanic eruption hazards. Publish and distribute a guide to volcano preparedness.

2018 update: Public education and preparedness has been limited. The school educates its students about volcanic hazards who then disseminate the information to their family members.

Section 7. Climate Change

Hazard Description

For this HMP, climate change refers to the long-term variation in atmospheric composition and weather patterns on a global scale. Global climate change may occur gradually due to small variations or rapidly due to large catastrophic forces. Greenhouse gasses, especially carbon dioxide (CO_2) and methane (CH_4), are commonly regarded as the most significant factors influencing the Earth's current climate.

Significant atmospheric variations may also be influenced by more than one event, for instance, an asteroid impact and a major eruption over a longer time period. For scientists studying climate change, both hazards imply different time periods. Therefore, the time period estimates for climate change events tend to vary and cannot be accurately applied to current predictive climate change models, which now must account for human activity. This is significant because hazard mitigation planning relies greatly upon the historical record.

Location

Climate change is a global event. Therefore, the entire community of Togiak is vulnerable to climate change.

Extent

Through studies of the historical record, climate change affects water acidity, atmospheric composition, precipitation, weather patterns, and temperatures.

Local Impact

Climate change has the potential to aggravate natural disasters along the coastline, particularly flooding and erosion. Climate change will continue to exacerbate these issues.

Life-long residents of Togiak noted that the indicating a changing climate:

- Warmer winters;
- Drier summers;
- Less sea ice to protect the shoreline during fall/winter storms;
- Impacts on the fall moose season;
- Less snow and smaller snowdrifts during the winter;
- More frequent lightning storms in the area; and
- More wildfires in the area as a result of drier conditions and lightning strikes.

Probability

Given the Earth's history of climate change, the current observed changes in the atmosphere, and the criteria identified in Table 10, it is **possible** a disaster event attributed to climate change will occur in the next five years as the probability is greater than or equal to 10% but less than or equal to 20% likely per year.

Climate Change Mitigation Goals and Projects

Climate Change Mitigation Goals

Goal 1: Public Education about Climate Change.

Provide information about the hazards associated with Climate Change.

Climate Change Mitigation Projects

CC-1. Public Education.

Publish and distribute information about Climate Change, which may include recent scientific studies and ways residents can be environmentally responsible. Also, ensure that the elders in the community share stories about the changes they have seen around the community during their lifetime.

Section 8. Hazards Not Profiled in the 2018 Togiak HMP

Avalanche

Alaska experiences many snow avalanches every year. The exact number is undeterminable as most occur in isolated areas and go unreported. Avalanches tend to occur repeatedly in localized areas and can sheer trees, cover communities and transportation routes, destroy buildings, and cause death. Alaska leads the nation in avalanche accidents per capita.

Avalanche Vulnerability Assessment

The terrain surrounding Togiak does not provide the necessary conditions for an avalanche. No threat from avalanche is present in Togiak.

Tsunami

A tsunami is a series of ocean waves generated by any rapid large-scale disturbance of the seawater. These waves can travel at speeds of up to 600 MPH in the open ocean. Most tsunamis are generated by earthquakes, but they may also be caused by volcanic eruptions, landslides (above or under sea in origin), undersea slumps, or meteor impacts.

Tsunami damage is a direct result of three factors:

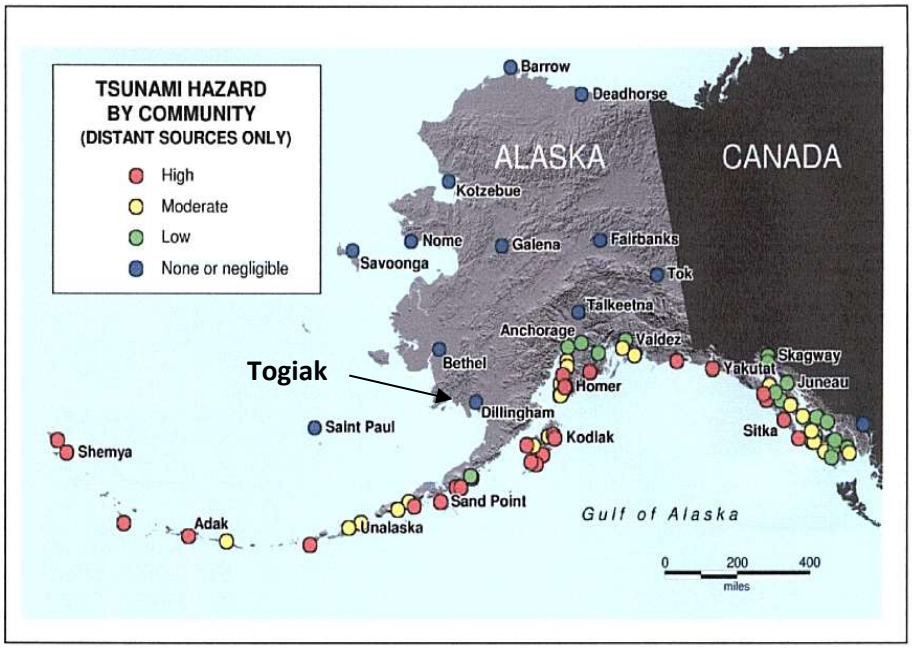
1. Inundation (the extent to which the water covers the land);
2. Wave action that will impact structures and moving objects that become projectiles; and
3. Coastal erosion.

A seiche is a wave that oscillates in partially or totally enclosed bodies of water. They can last from a few minutes to a few hours as a result of an earthquake, underwater landslide, atmospheric disturbance, or avalanche. The resulting effect is similar to bathtub water sloshing repeatedly from side to side. The reverberating water continually causes damage until the activity subsides. The factors for effective warning are similar to a local tsunami, in that the onset of the first wave can be a few minutes, giving virtually no time for warning.

Tsunami Vulnerability Assessment

As shown in Map 6, Togiak is in a region ranked as having negligible threat to no threat of tsunami. Also, there is no threat of a seiche in Togiak.

Map 6. Tsunami Hazard by Community

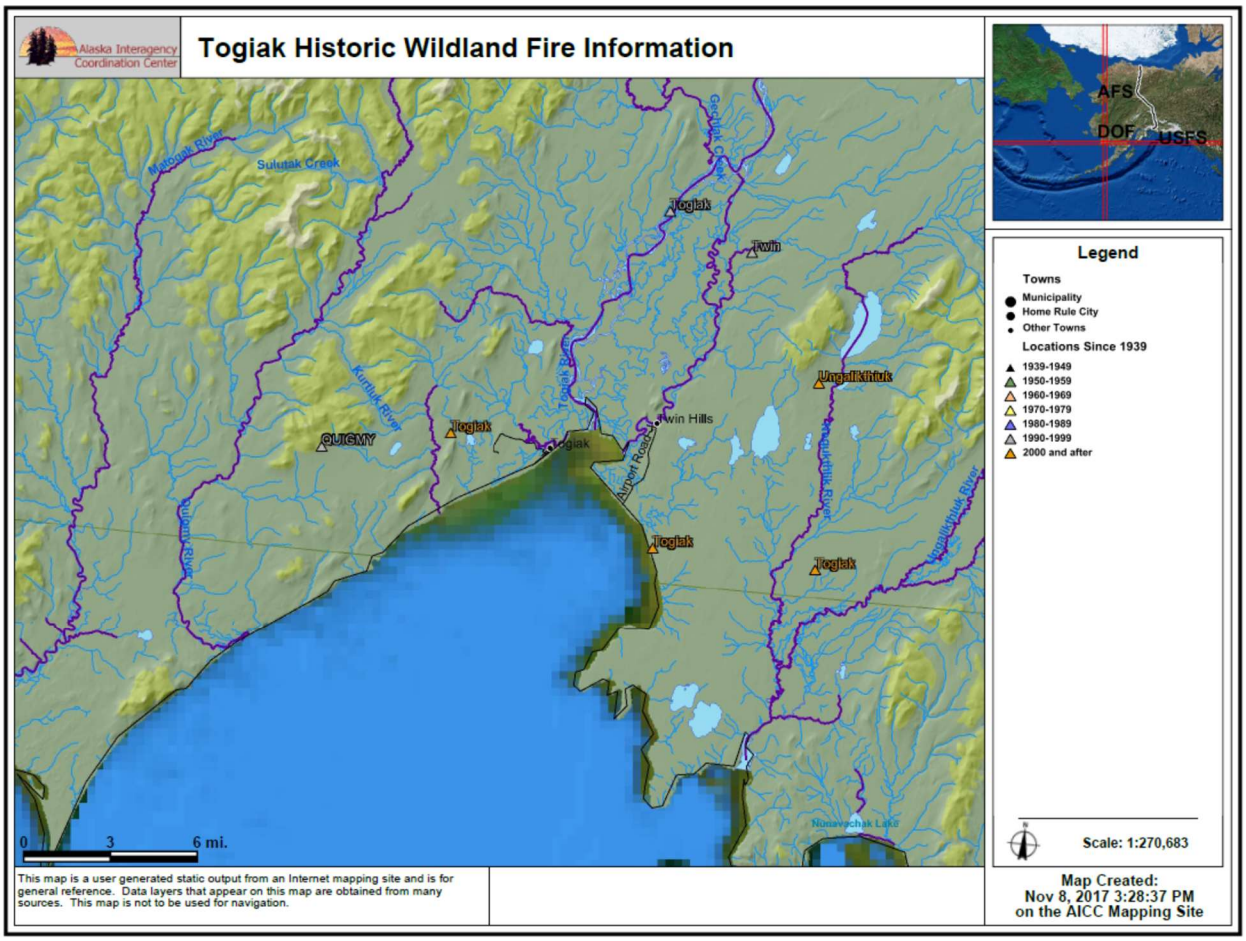


Wildland Fire

Wildland fires occur in every state in the country, and Alaska is no exception. Each year, between 600 and 800 wildland fires, mostly between March and October, burn across Alaska, causing extensive damage.

Fire is recognized as a critical feature of the natural history of many ecosystems. It is essential to maintain the biodiversity and long-term ecological health of the land. In Alaska, the natural fire regime is characterized by a return interval of 50 to 200 years, depending on the vegetation type, topography, and location. The role of wildland fire as an essential ecological process and natural change agent has been incorporated into the fire management planning process. The full range of fire management activities is exercised in Alaska to help achieve ecosystem sustainability, including its interrelated ecological, economic, and social consequences on firefighter and public safety and welfare, and natural and cultural resources threatened. Firefighter and public safety is always the first and overriding priority for all fire management activities.

Map 7. Togiak Historic Wildland Fire Information



Wildland Fire Hazard Vulnerability

According to the 2013 *Alaska State Hazard Mitigation Plan*, community residents, and historical information, Togiak is in an area where a wildland fire hazard is minimal. Since 1939, only two wildland fires have burned more than five acres of land within approximately:

- 1991—approximately 12,400 acres were burned as a result of a lightning strike.
- 2015—approximately 190 acres were burned as a result of manmade causes.

Residents of Togiak see that the City's wildland fire risk is increasing as a result of drier summers and more frequent lightning strikes, which may be attributed to climate change, and development into more wooded areas. If these trends continue, future plan updates should address the wildland fire hazard of the community.

Ground Failure

Ground failure describes landslide, subsidence, unstable soils, and other gravitational soil movement. Soil movement influences can include rain, snow, and/or water saturation induced avalanches or

landslides; as well as be influenced by seismic activity, melting permafrost, river or coastal embankment undercutting, or a combination of steep slope conditions.

Wildland Fire Hazard Vulnerability

According to the 2013 *Alaska State Hazard Mitigation Plan*, community residents, and historical information, Togiak is in an area where ground failure is not present.

Chapter 4. Mitigation Strategy

Benefit - Cost Review

The methods for conducting a Benefit-Cost Review are outlined in the FEMA How-To-Guide Benefit-Cost Review in Mitigation Planning (FEMA 386-5).

The projects listed in the Benefit-Cost Listing Table (Table 19) were prioritized using a listing of benefits and costs review method as described in the FEMA How-To-Guide Benefit-Cost Review in Mitigation Planning (FEMA 386-5).

Due to monetary as well as other limitations, it is often impossible to implement all mitigation actions. Therefore, the most cost-effective actions for implementation will be pursued for funding first, not only to use resources efficiently, but also to make a realistic start toward mitigating risks.

Due to the dollar value associated with both life-safety and critical facilities, the prioritization strategy represents a special emphasis on benefit-cost review. The factors of life-safety and critical facilities steered the prioritization towards projects with likely good benefit-cost ratios. The following factors were used in assigning the priority on the benefit-cost listing table.

1. Extent to which benefits are maximized when compared to the costs of the projects, the Benefit Cost Ratio must be 1.0 or greater.
2. Extent the project reduces risk to life-safety.
3. Project protects critical facilities or critical City functionality.
4. Hazard probability.
5. Hazard severity.

This method supports the principle of benefit-cost review by using a process that demonstrates a special emphasis on maximization of benefits over costs. Projects that demonstrate benefits over costs and that can start immediately were given a description of high priority. Projects that the costs somewhat exceed immediate benefit and that can start within five years (or before the next update) were given a description of medium priority, with a timeframe of one to five years. Projects that are very costly without known benefits, probably cannot be pursued during this plan cycle, but are important to keep as an action, were given a description of low priority and designated as long-term (FEMA 386-5).

Benefit-Cost Analysis

The following section, written by FEMA, explains how to perform a Benefit-Cost Analysis (BCA). The complete guidelines document, a benefit-cost analysis document, and benefit-cost analysis technical assistance are available online http://www.fema.gov/benefit-cost-analysis.

Facilitating BCA

Although the preparation of a BCA is a technical process, FEMA has developed software, written materials, and training that simplify the process of preparing BCAs. FEMA has a suite of BCA software for a range of

major natural hazards: earthquake, fire (wildland/urban interface fires), flood (riverine, coastal A-Zone, coastal V-Zone), hurricane wind (and typhoon), and tornado.

Sometimes there is not enough technical data available to use the BCA software mentioned above. When this happens, or for other common, smaller-scale hazards or more localized hazards, BCAs can be done with the Frequency Damage Method (i.e., the Riverine Limited Data module), which is applicable to any natural hazard as long as a relationship can be established between how often natural hazard events occur and how much damage and losses occur as a result of the event. This approach can be used for coastal storms, windstorms, freezing, mud/landslides, severe ice storms, snow, tsunami, and volcano hazards.

Applicants and sub-applicants must use FEMA-approved methodologies and software to demonstrate the cost-effectiveness of their projects. This will ensure that the calculations and methods are standardized, facilitating the evaluation process. Alternative BCA software may also be used, but only if the FEMA Regional Office and FEMA Headquarters approve the software. The latest software for preparing Benefit-Cost Analysis is available from FEMA Regional via the BCA Helpline, toll-free number at (866) 222-3580.

The BCA Helpline is also available to provide BCA software, technical manuals, and other BCA reference materials as well as to provide technical support for BCA. For further technical assistance, applicants or sub-applicants may contact their State Mitigation Office, the FEMA Regional Office, or the BCA Helpline. FEMA and the BCA Helpline provide technical assistance regarding the preparation of a BCA.

Eligible Projects for PDM Funding

The PDM program is Federally-funded through FEMA at 75% of the project cost and requires a 25% local fund match. The program is annual, nationally-competitive, and is intended to reduce overall risks to the population and structures, while also reducing reliance on funding from actual disaster declarations.

A Hazard Mitigation Planning grant is only available for communities that do not have a FEMA/State-approved and community-adopted HMP. A Hazard Mitigation Project grant is only available for communities that have a FEMA/State-approved and community-adopted HMP. Hazard Mitigation Projects are intended to reduce risk to life and property, and examples include:

- Elevation of flood prone structures;
- Structural and non-structural seismic retrofits of public facilities;
- Voluntary acquisition or relocation of structures out of the floodplain;
- Natural hazard protective measures for utilities, water, and sanitary sewer systems; and
- Localized storm water management and flood control projects.

Eligible Projects for HMGP Funding

To be eligible for funding under the HMGP, proposed measures must meet the minimum project criteria under 44 CFR 206.434(b).

These criteria are designed to ensure that the most appropriate projects are selected for funding. Priorities have remained the same since the 2009 HMP as many actions have not been implemented due to lack of appropriate funding. Projects may be of any nature that will result in protection of public or private property from natural hazards. Some types of projects that may be eligible include:

- Acquisition of hazard-prone property and conversion to open space;
- Retrofitting existing buildings and facilities;
- Elevation of flood-prone structures;
- Vegetative management/soil stabilization;
- Infrastructure protection measures;
- Storm water management;
- Minor structural flood control projects; and
- Post-disaster code enforcement activities.

The following types of projects are not eligible under the HMGP:

- Retrofitting places of worship (or other projects that solely benefit religious organizations); and
- Projects in progress.

There are five minimum criteria that all projects must meet to be considered for funding:

- Conforms with the State Hazard Mitigation Plan;
- Provides beneficial impact upon the designated disaster area;
- Conforms with environmental laws and regulations;
- Solves a problem independently or constitutes a functional portion of a solution; and
- Is cost-effective.

Benefit – Costs Review of Projects

Table 19 lists mitigation projects and their benefits, costs, and prioritization.

Table 19. Benefit - Costs Review Listing

Mitigation Projects	Benefits (pros)	Costs or Issues (cons)	Priority
Flood/Erosion (FLD)			
FLD-1. Bulkhead Rehabilitation.	Life/Safety issue Risk reduction Benefit to entire community Reduced maintenance costs – currently costs >$5,000 annually for replacement rock backfill.	Dollar cost high, but not determined. Three-mile seawall project cost $3 million in 1988. Coordination with USACE necessary.	High
FLD-2. Elevation and/or reinforcement of roads.	Life/Safety issue Risk reduction Benefit to entire community City has crushed gravel resources	Dollar cost high. Can exceed $75,000/mile. Coordination with State and BIA needed.	High
FLD-3. Relocate existing and new public safety facilities to areas above the 100-year floodplain.	Life/Safety issue Risk reduction Benefit to entire community	Dollar cost high, but not yet determined.	Medium
FLD-4. Emergency shelter access route.	Life/Safety issue Risk reduction Benefit to entire community City has crushed gravel resources	Dollar cost high. Can exceed $1 million/mile. Coordination with State and BIA needed.	Medium
FLD-5. Improve drainage in Togiak.	Life/Safety issue Risk reduction Benefit to entire community City has crushed gravel resources	Engineering required Costs not determined.	High

Mitigation Projects	Benefits (pros)	Costs or Issues (cons)	Priority
FLD-6. Suite of Emergency Plans and Training/Drills: • Emergency Operations • Community Evacuation	The suite of emergency plans is the most immediate, most near-term and cost-effective mechanism to reduce the risk of loss to lives and property.	Community will need technical assistance to complete this project.	Medium
FLD-7. Public Education.	Life/Safety issue Risk reduction Benefit to entire community Inexpensive Could be implemented annually	Staff time	High
FLD-8. Togiak floodplain maps.	Completed	Completed	Completed
FLD-9: Continue to obtain flood insurance for all City structures, and continue compliance with NFIP.	Life/Safety project Could be done annually Benefit to entire community to have NFIP insurance on public buildings Inexpensive	Staff time	High

Mitigation Projects	Benefits (pros)	Costs or Issues (cons)	Priority
Severe Weather (SW)			
SW- 1. Research and consider instituting the National Weather Service program of "Storm Ready."	Life/Safety issue Risk reduction Benefit to entire community Inexpensive State assistance available	Staff time	High
SW -2. Conduct special awareness activities, such as Winter Weather Awareness Week, Flood Awareness Week, etc.	Life/Safety issue Risk reduction Benefit to entire community Inexpensive State assistance available Could be an annual event	Staff time	High
SW- 3. Expand public awareness about NOAA Weather Radio for continuous weather broadcasts and warning tone alert capability.	Life/Safety issue / Risk reduction Benefit to entire community Inexpensive State assistance available Could be an annual event	Staff time	High
SW- 4. Encourage weather-resistant building construction materials and practices.	Risk and damage reduction Benefit to entire community	Would require ordinance change Potential for increased staff time Research into feasibility necessary Political and public support not determined	Medium
Earthquake			
E-1. Identify buildings and facilities that must be able to remain operable during and following an earthquake event.	Life/Safety issue/Risk reduction Benefit to entire community	Staff time	High

Mitigation Projects	Benefits (pros)	Costs or Issues (cons)	Priority
E-2. Perform an engineering assessment of the earthquake vulnerability of each identified critical infrastructure.	Completed	Completed	Completed
E-3. Nonstructural Mitigation Projects (such as bookshelf tie-downs, water heater strapping, computer servers being made earthquake resistant, etc.).	Inexpensive, reduces risk of property damage and injury from falling objects	Volunteer time	Medium
Volcano			
V-1. Public Education and Preparedness. Provide information about volcanic hazards in the region.	Life/Safety issue/Risk reduction Benefit to entire community	Staff time	Medium
Climate Change			
CC-1. Public Education. Publish and distribute information about Climate Change, which may include recent scientific studies and ways residents can be environmentally responsible.	Low-cost Informs residents about future hazards that may affect the community	Staff/volunteer time Lack of consistent information about climate change	Low

Priorities Levels:

High A life/safety project or benefits clearly exceed the cost or can be implemented 0 – 1 year.

Medium More study required to designate as a life/safety project or benefits may exceed the cost, or can be implemented in 1 – 5 years.

Low More study required to designate as a life/safety project or not known if benefits exceed the costs, or long-term project, implementation will not occur for over five years

Mitigation Projects

Table 20 presents Togiak's strategy for mitigation of the natural hazards faced by the community and includes a brief description of the projects, lead agencies, costs, potential funding sources, and an estimated timeframe for each project.

Table 20. Mitigation Strategy

Mitigation Projects	Responsible Agency	Cost	Funding Sources	Estimated Timeframe	Project Status (as of 2018)
Flood/Erosion (FLD)					
FLD-1. Bulkhead Rehabilitation.	City Administrator	Cost not determined.	PDM/HMGP	>5 years	This project remains a high priority project. Approximately $3 million in repairs to the 1984-86 project were completed in 2017. The City is seeking funding for further protection measures.
FLD-2. Elevation and/or reinforcement of roads.	City Administrator	Estimated >$1 million/mile	PDM/HMGP, DOT&PF, City, Togiak Traditional Council	1 year	The City has $125,000 from the Bureau of Indian Affairs (BIA) to be utilized to elevate and reinforce roads. This project is currently entering the design phase as the City surveys the amount of material necessary to raise the roads. The BIA funds are for projects FLD-2 and FLD-4. More funding may be necessary to complete these projects.
FLD-3. Relocate existing public safety facilities to areas above the 100-year floodplain.	City Administrator	Estimated $75,000+	PDM/HMGP, City, Togiak Traditional Council	1-5 years	Cost is $2 million; not completed due to lack of funding
FLD-4. Emergency shelter access route.	City Administrator	>$1 million/mile	DOT&PF, City, Togiak Traditional Council	1-5 years	As with project FLD-2, the City has $125,000 from BIA to assist in constructing a second route. This project is currently entering the design phase as the City surveys the amount of material necessary to raise the roads and plans to begin work in the summer of 2018. More funding may be necessary to complete this project.

Mitigation Projects	Responsible Agency	Cost	Funding Sources	Estimated Timeframe	Project Status (as of 2018)
FLD-5. Improve drainage in Togiak.	City Administrator	Estimated >$75,000/mile	Alaska Legislature or State Capital Budgets	1 year	Drainage improvements have not been completed due to lack of funding; however, the City works to keep snow clear of the lower areas of town to reduce potential for flooding.
FLD-6. Suite of Emergency Plans and Training/Drills: • Emergency Operations • Community Evacuation	City Administrator	$75,000	State Capital Budgets, DCRA	1-5 years	In progress; two drills have been conducted, and lessons have been learned to better implement these drills. The City has a standing agreement with the school bus operator to assist in the evacuation of the town in the event of a flood.
FLD-7. Public Education.	City Administrator	Staff Time	City, Togiak Traditional Council	Ongoing	Limited progress made; however, schools implement drills, and information is disseminated from students to their families.
FLD-8. Togiak floodplain maps.	City Administrator	Completed	Completed	Completed	Completed; FIRMs became effective February 2010.
FLD-9. Continue to obtain flood insurance for all City structures, and continue compliance with NFIP.	City Administrator	<$1,500	City	Ongoing	Ongoing; the City works to maintain flood insurance and keep in compliance with the NFIP.
Severe Weather (SW)					
SW-1. Research and consider instituting the National Weather Service program of *"Storm Ready."*	City Administrator	Staff Time	City, NWS/NOAA	1 year	Remains high priority project. The City fulfills some of the criteria to become a StormReady community but requires further organization to receive the official designation
SW-2. Conduct special awareness activities, such as Winter Weather Awareness Week, Flood Awareness Week, etc.	City Administrator	Staff Time	City, Togiak Traditional Council, DCRA, DHS&EM	1 year	Progress has been limited; however, schools implement drills, and information is disseminated from students to their families.

Mitigation Projects	Responsible Agency	Cost	Funding Sources	Estimated Timeframe	Project Status (as of 2018)
SW-3. Expand public awareness about NOAA Weather Radio for continuous weather broadcasts and warning tone alert capability.	City Administrator	Staff Time	City, NOAA, Togiak Traditional Council	Ongoing	City is working to increase the availability of weather updates to the community, but this project has not been fully implemented.
SW-4. Encourage weather-resistant building construction materials and practices.	City Administrator	Staff Time	City, Togiak Traditional Council	Ongoing	Ongoing; part of all new construction to include water plant, sewer lift station, City office, and school.
Earthquake (E)					
E-1. Identify buildings and facilities that must be able to remain operable during and following an earthquake event.	City Administrator	Completed	Completed	Completed	Completed
E-2. Perform an engineering assessment of the earthquake vulnerability of each identified critical infrastructure owned by the City.	City Administrator	Completed	Completed	Completed	Completed in 2014; $1.8 million in consulting fees.
E-3. Nonstructural Mitigation Projects (such as bookshelf tie-downs, comp. servers being made earthquake resistant, etc.) in critical facilities.	City Administrator	>$5,000	City, Togiak Traditional Council	1-5 years	Nonstructural mitigation projects have been completed at the school. Use engineer assessment to identify future projects.
Volcano (V)					
V -1. Public Education and Preparedness. Provide information about volcanic hazards in the region.	City Administrator	Inexpensive	City, AVO, Togiak Traditional Council	1-5 years	Public education and preparedness has been limited. School educates children, and the information is then disseminated to family members.
Climate Change (CC)					
CC-1. Public Education. Publish and distribute information about Climate Change, which may include recent scientific studies and ways residents can be environmentally responsible.	City Council	Inexpensive	City, Climate Action for Alaska, Togiak Traditional Council	Ongoing	Added in 2018 Update.

Glossary of Terms

A-Zones

Type of zone found on all Flood Hazard Boundary Maps (FHBMs), Flood Insurance Rate Maps (FIRMs), and Flood Boundary and Floodway Maps (FBFMs).

Acquisition

Local governments can acquire lands in high hazard areas through conservation easements, purchase of development rights, or outright purchase of property.

Asset

Any manmade or natural feature that has value, including, but not limited to people; buildings; infrastructure like bridges, roads, and sewer and water systems; lifelines like electricity and communication resources; or environmental, cultural, or recreational features like parks, dunes, wetlands, or landmarks.

Base Flood

A term used in the National Flood Insurance Program to indicate the minimum size of a flood. This information is used by a community as a basis for its floodplain management regulations. It is the level of a flood, which has a one-percent chance of occurring in any given year. Also known as a 100-year flood elevation or one-percent chance flood.

Base Flood Elevation (BFE)

The elevation for which there is a one-percent chance in any given year that floodwater levels will equal or exceed it. The BFE is determined by statistical analysis for each local area and designated on the Flood Insurance Rate Maps. It is also known as 100-year flood elevation.

Base Floodplain

The area that has a one percent chance of flooding (being inundated by flood waters) in any given year.

Building

A structure that is walled and roofed, principally above ground and permanently affixed to a site. The term includes a manufactured home on a permanent foundation on which the wheels and axles carry no weight.

Building Code

The regulations adopted by a local governing body setting forth standards for the construction, addition, modification, and repair of buildings and other structures for the purpose of protecting the health, safety, and general welfare of the public.

Climate Change

A change in local, regional, or global climate patterns.

Community

Any state, area or political subdivision thereof, or any Indian tribe or tribal entity that has the authority to adopt and enforce statutes for areas within its jurisdiction.

Community Rating System (CRS)

The Community Rating System is a voluntary program that each municipality or county government can choose to participate in. The activities that are undertaken through CRS are awarded points. A community's points can earn people in their community a discount on their flood insurance premiums.

Critical Facility

Facilities that are critical to the health and welfare of the population and that are especially important during and after a hazard event. Critical facilities include, but are not limited to, shelters, hospitals, and fire stations.

Designated Floodway

The channel of a stream and that portion of the adjoining floodplain designated by a regulatory agency to be kept free of further development to provide for unobstructed passage of flood flows.

Development

Any man-made change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations or of equipment or materials.

Digitize

To convert electronically points, lines, and area boundaries shown on maps into x, y coordinates (e.g., latitude and longitude, universal transverse Mercator, or table coordinates) for computer use.

Disaster Mitigation Act (DMA)

DMA 2000 (public Law 106-390) is the latest legislation of 2000 (DMA 2000) to improve the planning process. It was signed into law on October 10, 2000. This new legislation reinforces the importance of mitigation planning and emphasizes planning for disasters before they occur.

Earthquake

A sudden motion or trembling that is caused by a release of strain accumulated within or along the edge of the earth's tectonic plates.

Elevation

The raising of a structure to place it above flood waters on an extended support structure.

Emergency Operations Plan

A document that: describes how people and property will be protected in disaster and disaster threat situations; details who is responsible for carrying out specific actions; identifies the personnel, equipment, facilities, supplies, and other resources available for use in the disaster; and outlines how all actions will be coordinated.

Erosion

The wearing away of the land surface by running water, wind, ice, or other geological agents.

Federal Disaster Declaration

The formal action by the President to make a State eligible for major disaster or emergency assistance under the Robert T. Stafford Relief and Emergency Assistance Act, Public Law 93-288, as amended. Same meaning as a Presidential Disaster Declaration.

Federal Emergency Management Agency (FEMA)

A federal agency created in 1979 to provide a single point of accountability for all federal activities related to hazard mitigation, preparedness, response, and recovery.

Flood

A general and temporary condition of partial or complete inundation of water over normally dry land areas from (1) the overflow of inland or tidal waters, (2) the unusual and rapid accumulation or runoff of surface waters from any source, or (3) mudflows or the sudden collapse of shoreline land.

Flood Disaster Assistance

Flood disaster assistance includes development of comprehensive preparedness and recovery plans, program capabilities, and organization of Federal agencies and of State and local governments to mitigate the adverse effects of disastrous floods. It may include maximum hazard reduction, avoidance, and mitigation measures, as well policies, procedures, and eligibility criteria for Federal grant or loan assistance to State and local governments, private organizations, or individuals as the result of the major disaster.

Flood Elevation

Elevation of the water surface above an establish datum (reference mark), e.g. National Geodetic Vertical Datum of 1929, North American Datum of 1988, or Mean Sea Level.

Flood Hazard

Flood Hazard is the potential for inundation and involves the risk of life, health, property, and natural value. Two reference base are commonly used: (1) For most situations, the Base Flood is

that flood which has a one-percent chance of being exceeded in any given year (also known as the 100-year flood); (2) for critical actions, an activity for which a one-percent chance of flooding would be too great, at a minimum the base flood is that flood which has a 0.2 percent chance of being exceeded in any given year (also known as the 500-year flood).

Flood Insurance Rate Map

Flood Insurance Rate Map (FIRM) means an official map of a community, on which the Administrator has delineated both the special hazard areas and the risk premium zones applicable to the community.

Flood Insurance Study

Flood Insurance Study or Flood Elevation Study means an examination, evaluation and determination of flood hazards and, if appropriate, corresponding water surface elevations, or an examination, evaluations and determination of mudslide (i.e., mudflow) and/or flood-related' erosion hazards.

Floodplain

A "floodplain" is the lowland adjacent to a river, lake, or ocean. Floodplains are designated by the frequency of the flood that is large enough to cover them. For example, the 10-year floodplain will be covered by the 10-year flood. The 100-year floodplain by the 100-year flood.

Floodplain Management

The operation of an overall program of corrective and preventive measures for reducing flood damage, including but not limited to emergency preparedness plans, flood control works and floodplain management regulations.

Floodplain Management Regulations

Floodplain Management Regulations means zoning ordinances, subdivision regulations, building codes, health regulations, special purpose ordinances (such as floodplain ordinance, grading ordinance and erosion control ordinance) and other applications of police power. The term describes such state or local regulations, in any combination thereof, which provide standards for the purpose of flood damage prevention and reduction.

Flood Zones

Zones on the Flood Insurance Rate Map (FIRM) in which a Flood Insurance Study has established the risk premium insurance rates.

Flood Zone Symbols

A - Area of special flood hazard without water surface elevations determined.

A1-30 - AE Area of special flood hazard with water surface elevations determined.

AO - Area of special flood hazard having shallow water depths and/or unpredictable flow paths between one and three feet.

A-99 - Area of special flood hazard where enough progress has been made on a protective system, such as dikes, dams, and levees, to consider it complete for insurance rating purposes.

AH - Area of special flood hazard having shallow water depths and/or unpredictable flow paths between one and three feet and with water surface elevations determined.

B - X Area of moderate flood hazard.

C - X Area of minimal hazard.

D - Area of undetermined but possible flood hazard.

Geographic Information System (GIS)

A computer software application that relates physical features of the earth to a database that can be used for mapping and analysis.

Governing Body

The legislative body of a municipality that is the assembly of a borough or the council of a city.

Hazard

A source of potential danger or adverse condition. Hazards in the context of this plan will include naturally occurring events such as floods, earthquakes, tsunami, coastal storms, landslides, and wildfires that strike populated areas. A natural event is a hazard when it has the potential to harm people or property.

Hazard Event

A specific occurrence of a particular type of hazard.

Hazard Identification

The process of identifying hazards that threaten an area.

Hazard Mitigation

Any action taken to reduce or eliminate the long-term risk to human life and property from natural hazards. (44 CFR Subpart M 206.401)

Hazard Mitigation Grant Program (HMGP)

The program authorized under section 404 of the Stafford Act, which may provide funding for mitigation measures identified through the evaluation of natural hazards conducted under §322 of the Disaster Mitigation Act 2000.

Hazard Profile

A description of the physical characteristics of hazards and a determination of various descriptors including magnitude, duration, frequency, probability, and extent. In most cases, a community can most easily use these descriptors when they are recorded and displayed as maps.

Hazard and Vulnerability Analysis

The identification and evaluation of all the hazards that potentially threaten a jurisdiction and analyzing them in the context of the jurisdiction to determine the degree of threat that is posed by each.

Mitigate

To cause something to become less harsh or hostile, to make less severe or painful.

Mitigation Plan

A systematic evaluation of the nature and extent of vulnerability to the effects of natural hazards typically present in the State and includes a description of actions to minimize future vulnerability to hazards.

National Flood Insurance Program

The Federal program, created by an act of Congress in Program (NFIP) 1968 that makes flood insurance available in communities that enact satisfactory floodplain management regulations.

One Hundred (100)-Year

The flood elevation that has a one-percent chance of occurring in any given year. It is also known as the Base Flood.

Planning

The act or process of making or carrying out plans; the establishment of goals, policies, and procedures for a social or economic unit.

Repetitive Loss Property

A property that is currently insured for which two or more National Flood Insurance Program losses (occurring more than ten days apart) of at least $1000 each have been paid within any 10-year period since 1978.

Risk

The estimated impact that a hazard would have on people, services, facilities, and structures in a community; the likelihood of a hazard event resulting in an adverse condition that causes injury or damage. Risk is often expressed in relative terms such as a high, moderate, or low likelihood of sustaining damage above a particular threshold due to a specific type of hazard event. It can

also be expressed in terms of potential monetary losses associated with the intensity of the hazard.

Riverine

Relating to, formed by, or resembling rivers (including tributaries), streams, creeks, brooks, etc.

Riverine Flooding

Flooding related to or caused by a river, stream, or tributary overflowing its banks due to excessive rainfall, snowmelt or ice.

Runoff

That portion of precipitation that is not intercepted by vegetation, absorbed by land surface, or evaporated, and thus flows overland into a depression, stream, lake, or ocean (runoff, called immediate subsurface runoff, also takes place in the upper layers of soil).

Seiche

An oscillating wave (also referred to as a seismic sea wave) in a partially or fully enclosed body of water. May be initiated by landslides, undersea landslides, long period seismic waves, wind and water waves, or a tsunami.

Seismicity

Describes the likelihood of an area being subject to earthquakes.

State Disaster Declaration

A disaster emergency shall be declared by executive order or proclamation of the Governor upon finding that a disaster has occurred or that the occurrence or the threat of a disaster is imminent. The state of disaster emergency shall continue until the governor finds that the threat or danger has passed or that the disaster has been dealt with to the extent that emergency conditions no longer exist and terminates the state of disaster emergency by executive order or proclamation. Along with other provisions, this declaration allows the governor to utilize all available resources of the State as reasonably necessary, direct and compel the evacuation of all or part of the population from any stricken or threatened area if necessary, prescribe routes, modes of transportation and destinations in connection with evacuation and control ingress and egress to and from disaster areas. It is required before a Presidential Disaster Declaration can be requested.

Topography

The contour of the land surface. The technique of graphically representing the exact physical features of a place or region on a map.

Tribal Government

A Federally recognized governing body of an Indian or Alaska native Tribe, band, nation, pueblo, village or community that the Secretary of the Interior acknowledges to exist as an Indian tribe under the Federally Recognized Tribe List Act of 1994, 25 U.S.C. 479a. This does not include Alaska Native corporations, the ownership of which is vested in private individuals.

Tsunami

A sea wave produced by submarine earth movement or volcanic eruption with a sudden rise or fall of a section of the earth's crust under or near the ocean. A seismic disturbance or landslide can displace the water column, creating a rise or fall in the level of the ocean above. This rise or fall in sea level is the initial formation of a tsunami wave.

Vulnerability

Describes how exposed or susceptible to damage an asset it. Vulnerability depends on an asset's construction, contents, and the economic value of its functions. The vulnerability of one element of the community is often related to the vulnerability of another. For example, many businesses depend on uninterrupted electrical power – if an electrical substation is flooded, it will affect not only the substation itself, but a number of businesses as well. Other, indirect effects can be much more widespread and damaging than direct ones.

Vulnerability Assessment

The extent of injury and damage that may result from hazard event of a given intensity in a given area. The vulnerability assessment should address impacts of hazard events on the existing and future built environment.

Watercourse

A natural or artificial channel in which a flow of water occurs either continually or intermittently.

Watershed

An area that drains to a single point. In a natural basin, this is the area contributing flow to a given place or stream.

Bibliography

1. DHS&EM. (October 2013). *Alaska State Hazard Mitigation Plan*.
2. DHS&EM. (2016). *Alaska DHS&EM Disaster Cost Index*.
3. Alaska Interagency Coordination Center (AICC), Fire History in Alaska GIS Mapper, website: https://afsmaps.blm.gov/imf_firehistory/imf.jsp?site=firehistory.
4. *Alaska Volcano Observatory,* website: http://www.avo.alaska.edu/.
5. Division of Community and Regional Affairs (DCRA), Community Information: https://www.commerce.alaska.gov/web/dcra/communityinformation.aspx.
6. *FEMA Benefit-Cost Analysis Website:* http://www.fema.gov/benefit-cost-analysis.
7. FEMA How-to Guides
    - *Getting Started: Building Support for Mitigation Planning* (FEMA 386-1).
    - *Understanding Your Risks: Identifying Hazards and Estimating Losses* (FEMA 386-2).
    - *Developing the Mitigation Plan: Identifying Mitigation Actions and Implementing Strategies* (FEMA 386-3).
    - *Bringing the Plan to Life: Implementing the Hazard Mitigation Plan* (FEMA 386-4).
    - *Using Benefit-Cost Review in Mitigation Planning* (FEMA 386-5).
8. Bristol Environmental & Engineering Services Corporation. (June 2003). *Final Engineering Study Togiak Dock and Boat Launch.*
9. Selkregg, Lidia. (1976). *Alaska Regional Profiles, Southwest Region.* Volume III. University of Alaska, Arctic Environmental and Information Data Center.
10. Mason, O., Neal, W. J., Pilkey, O. H., Bullock, J., Fathauer, T., Pilkey, D., et al. (1997). *Living with the Coast of Alaska.* Durham and London: Duke University Press.
11. National Oceanic and Atmospheric Administration/National Weather Service (NOAA/NWS), Storm Events Database, Bulk Data Download, website: https://www.ncdc.noaa.gov/stormevents/ftp.jsp.
12. Tetra Tech. (1983). *Togiak Erosion Control Assessment.*
13. USACE. (2009). *Alaska Baseline Erosion Assessment.*
14. USACE. Flood and Erosion GIS Viewer website: https://alliedgis.maps.arcgis.com/apps/webappviewer/index.html?id=251ecb3f62524857971e30992e7cdd18.
15. USGS, Earthquake Probability Mapping, website: http://www.usgs.gov.
16. University of Alaska, Fairbanks, and Alaska Earthquake Information Center (AEIC) website: http://earthquake.alaska.edu/.

17. Western Regional Climate Center (WRCC), US COOP Station Maps website: https://wrcc.dri.edu/coopmap/#.

18. WHPacific and Bechtol Planning & Development. (October 2009). *City of Togiak Multi-Hazard Mitigation Plan*.

Web Sites with General Hazard Planning Information

American Planning Association:	http://www.planning.org
Association of State Floodplain Managers:	http://www.floods.org
Federal Emergency Management Agency:	http://www.fema.gov
Community Rating System:	http://www.fema.gov/national-flood-insurance-program-community-rating-system
Flood Mitigation Assistance Program:	https://www.fema.gov/flood-mitigation-assistance-grant-program
Hazard Mitigation Grant Program:	http://www.fema.gov/hazard-mitigation-grant-program
Individual Assistance Program:	http://www.fema.gov/individual-assistance-program-tools
Interim Final Rule:	https://www.fema.gov/media-library/assets/documents/4590
National Flood Insurance Program:	http://www.fema.gov/national-flood-insurance-program
Public Assistance Program:	http://www.fema.gov/public-assistance-local-state-tribal-and-non-profit

Appendix A: Public Involvement

December 4, 2017

Brent Nichols, CFM
State of Alaska
DMVA DHS&EM
P.O. Box 5750
Joint Base Elmendorf-Richardson, Alaska 99505-5750

Mr. Nichols:

This letter serves as the City of Togiak's Letter of Commitment to support DMVA DHS&EM and LeMay Engineering & Consulting, Inc. in their Federal Emergency Management Agency (FEMA) Pre-Disaster Mitigation (PDM) planning grant to update the 2009 hazard mitigation plan for the City of Togiak. The end goal of this grant is a State- and FEMA- approved hazard mitigation plan that the City of Togiak will adopt.

Sincerely,

Anna Mary Kasak
~~Teodoro Park~~
Mayor, City of Togiak

Hazard Mitigation Plan Update for Togiak, Alaska

Newsletter #1: December 2017

The State of Alaska, Department of Military and Veterans Affairs, Division of Homeland Security and Emergency Management (DHS&EM) was awarded a Pre-Disaster Mitigation Program grant from the Federal Emergency Management Agency (FEMA) to update the 2009 hazard mitigation plan (HMP) for the City of Togiak. This plan will assist the City as a valuable resource tool in making decisions. Additionally, communities must have a State- and FEMA-approved and community-adopted HMP plan to receive FEMA pre- and post- disaster grants.

LeMay Engineering & Consulting, Inc. was contracted to assist Togiak with preparing a 2017 HMP update. The HMP will identify all applicable natural hazards. The plan will identify the people and facilities potentially at risk and ways to mitigate damage from future hazard impacts.

Join the planning team and offer your advice: Any interested community member may join the planning team. To join, call or send Jennifer LeMay an email at jlemay@lemayengineering.com. The purpose of this newsletter is to introduce this project and encourage public involvement during this process. The goal is to receive comments, identify key issues or concerns, and improve mitigation ideas.

Attend the December 4, 2017, Meeting at 10 am at City Hall: The agenda will be a summary of the hazard mitigation plan process by Patrick LeMay. You're invited to provide input to the plan. Specifically, we'll be discussing which of the following hazards are realistic for Togiak: earthquake, tsunami, flood/erosion, ground failure/avalanche, severe weather, wildland fire, and climate change? Also, what facilities are critical to your community? What mitigation actions should be implemented to prevent damage from potential hazards?

For more information, contact:
Teodoro Pauk, Mayor (907) 493-5820
Patrick LeMay, PE, Planner (907) 250-9038
Jennifer LeMay, PE, PMP, Lead Planner (907) 350-6061
Brent Nichols, DMVA, DHS&EM Project Manager (907) 428-7085

City of Togiak Hazard Mitigation Plan Committee Introductory Meeting

December 4, 2017

10 AM at City Office

Name	Organization	Contact Information (phone or email)
Darryl Thompson	City of Togiak	907-493-2087 togwater@hushmail.com
Anna Maykasak	City of Togiak	507-891-5685 ernerculria@gmail.com
Anecia Kritz	City of Togiak	907-493-2055 AKritz07@Yahoo.com

Hazard Mitigation Planning Process

Updates to existing plans

Plans must be updated every five years and approved by DHS&EM and FEMA and then adopted by the community by resolution for the community to remain eligible for FEMA grant funding

This is a public process. Everyone who wants to be involved will be given the opportunity to be involved in this process. Send Jennifer LeMay, PE, PMP an email if you'd like more information at jlemay@lemayengineering.com or call her at (907) 350-6061.

We welcome public input and will have a public comment hearing at a public meeting for you to provide input on the plan.

Which hazards are applicable for your community?

- Flood
- Erosion
- Wildland Fire
- Tsunami/Seiche
- Earthquake
- Volcano
- Avalanche
- Ground Failure/Landslide
- Permafrost Degradation
- Severe Weather
- Climate Change

We're interested in information related to:

- hazard identification,
- profiles,
- previous occurrences,
- probability of occurrences, and
- typical recurrence intervals

for each potential hazard.

Plan Process

- Today's introductory meeting
- Gathering of data
- Draft Plan available for public comment (December is our goal month)
- Public hearing for Draft Plan (public comment period)
- State/FEMA review and pre-approval
- Newsletter announcing Final Plan (the public may still comment)
- City and/or Tribal adoption
- Final Approval from State/FEMA (prior to April 23, 2018).

After Plan is completed, approved, and adopted, your community will be eligible to apply for mitigation project funds from DHS&EM and FEMA for five years until the plan requires another update.

Contacts:
Patrick LeMay, PE, LeMay Engineering & Consulting, Inc. Planner (907) 250-9038
Jennifer LeMay, PE, PMP LeMay Engineering & Consulting, Inc. Planner (907) 350-6061
Brent Nichols, CFM, State of Alaska DHS&EM Hazard Mitigation Officer (907) 428-7085

Patrick M. LeMay, P.E.
President
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Anchorage, AK 99504
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December 4, 2017

Brent A. Nichols, EMSII, CFM
Emergency Management Specialist II & Certified Floodplain Manager
Department of Military and Veterans Affairs
Division of Homeland Security and Emergency Management
P.O. Box 5750
JBER, AK 99505-5750

Subject: **Hazard Mitigation Planning Process Trip Report**
City of Togiak, Alaska

On December 4, 2017, Patrick M. LeMay, PE of LeMay Engineering & Consulting, Inc. traveled to Togiak, Alaska. The purpose of this trip was to conduct an introductory meeting, gather hazard data, review with community leaders the applicable hazards for the area, review potential mitigation strategies that have been updated since the last plan update, and update the critical facilities within the community.

The Togiak Hazard Mitigation Plan Committee Introductory Meeting occurred at the Dillingham Airport from 11:00 AM to 3:00 PM and included:

Patrick M. LeMay, PE	LeMay Engineering & Consulting, Inc.
Darryl Thompson	City Manager
Anna May Kasak	Mayor
Anecia Kritz	City Council Member

Due to weather conditions, travel from Dillingham to Togiak was not possible. However, the community leaders were traveling to Anchorage, Alaska on the same day and travel from Togiak to Dillingham was possible. This allowed for the introductory data gathering meeting to occur at the Dillingham Airport with the same local representatives planning to attend the meeting in Togiak.

If you have any questions, please do not hesitate to call me at (907) 250-9038.

12/4/17
Patrick M. LeMay, P.E./Date
LeMay Engineering & Consulting, Inc.

Hazard Mitigation Plan Update for Togiak, Alaska

Newsletter #2 February 2018

LeMay Engineering & Consulting, Inc. was contracted to assist the City of Togiak with preparing an update to the 2009 HMP. The HMP identifies all-natural hazards with the potential to impact the community. The HMP also identifies the people and facilities potentially at risk and ways to mitigate damage from future hazard impacts.

Offer your comments on the Draft HMP Update: The goal of Newsletter #2 is to announce the availability of the Draft HMP and invite you to provide comments, identify key issues or concerns, and improve mitigation ideas. This HMP has been posted at the Togiak City Office for your review. Comments can be provided verbally to Jennifer LeMay at (907) 350-6061 or emailed to: jlemay@lemayengineering.com.

Attend the February 26, 2018, Meeting at 7 pm at City Hall: The agenda will be a summary of the plan for Togiak by John Farr and an opportunity for community members to provide comments on the plan. You're invited to provide input to the HMP and can present your comments verbally. We'll be discussing:

- 2018 HMP Hazards, which include:
  - Flood and Erosion
  - Severe Weather
  - Earthquake
  - Volcano
  - Climate Change

  What would be your top three hazards from the above list?
- Critical Infrastructure
- Vulnerability
- Mitigation Projects

For more information, contact:
Darryl Thompson, City Manager (907) 493-2087
Patrick LeMay, PE, Planner (907) 250-9038
Jennifer LeMay, PE, PMP, Lead Planner (907) 350-6061
Brent Nichols, DMVA, DHS&EM Project Manager (907) 428-7085

City of Togiak Hazard Mitigation Plan Update
Public Hearing on Draft HMP Update
February ~~26~~ 27, 2018 - 7pm at City Offices

Name	Organization	Contact Information (Phone or Email)
John Farr	LeMay Engineering.	907-980-5484
~~Es~~ther Fayer	City Council Member	907-493-2096
Anna May Kasak	City of Togiak	891-5685
Anecia Kritz	City of Kasak	493-2055
Carrie Burks	City Council Member	907-891-0011
Clara Martin	City of Togiak	907-493-6060
Maya Geltzer	Togiak member	907-493-6379
Nellie Thomas	City Council Member	907 493-2693
Darryl Thompson	City Administrator	togwater@493.hughmail.com 2087
Shawn Kamkahpak	City Clerk	cityoftogiak@outlook.com 907-493-5820

Togiak Hazard Mitigation Plan

Prepared by LeMay Engineering & Consulting, Inc.
for the City of Togiak

Togiak Hazard Mitigation Plan (HMP) Update

- The City developed a HMP in 2009, FEMA approved it in 2010, the HMP expired in 2015.
- FEMA requires HMPs to be updated every 5 years.
- The State of Alaska, Department of Military and Veterans Affairs, Division of Homeland Security and Emergency Management (DHS&EM) was awarded a Pre-Disaster Mitigation Program grant from FEMA to update the Togiak HMP.
- LeMay Engineering & Consulting, Inc. was contracted to assist the City with updating the HMP in 2018.

What is a Hazard Mitigation Plan (HMP)?

HMPs are community plans which include:

- 1. Profiles of natural hazards that affect a community
- 2. An assessment of the community's vulnerability to hazards
- 3. Mitigation actions to reduce the community's vulnerability to hazards

Natural Hazard Profiles

Hazard profiles detail the:

- Nature of hazard
- History of hazard's impacts on community
- Location (proximity to community)
- Extent (magnitude and severity)
- Impact on the City
- Probability of future events

Mitigation Actions

A mitigation action is a planned activity that will reduce the community's vulnerability to natural hazards. Mitigation actions are broadly categorized as:

- Prevention
- Property Protection
- Public Education and Awareness
- Natural Resource Protection
- Emergency Services
- Structural Projects

Natural Hazards affecting Togiak

The Togiak HMP identifies and profiles the following hazards:

- Earthquake
- Flood/Erosion
- Severe Weather
- Volcano
- Climate Change

What are other natural hazards that affect Togiak? (Avalanche, Landslide, Tsunami, Wildfire, etc.)

Flood/Erosion – Hazard Profile Overview

- The primary flooding hazard is storm surge flooding. Heavy rains or rapid thaw also cause flooding.
- The erosion hazards include coastal erosion and riverine erosion along Nasaurluq Creek.
- The most recent major storm surges occurred in 2005.
- Future erosion and land loss is likely, although the rate of future erosion may vary.

Flooding and Erosion Mitigation Action Plan

Goal #1: Reduce or prevent future flood damage.
Goal #2: Reduce loss of life or injuries from flood disasters.
Goal #3: Increase public awareness.

Mitigation Actions
Bulkhead Rehabilitation. (Goal 1) The community reported that the creek by the bulkhead has eroded nearly two feet of material away, and the bulkhead has started to lean toward the water. Consider lengthening the seawall to the southwest. Coordination with the USACE is needed on this project. **2018 update**: This project remains a high priority project. Approximately $3 million in repairs to the 1984-86 project were completed in 2017.

Flooding and Erosion Mitigation Action Plan (Cont'd)

Mitigation Actions

FLD-2. Elevation and/or reinforcement of roads. (Goal 1)
Elevate and reinforce roads that serve as barriers to rising waters or storm surges. Main roads throughout town have been identified as performing this function. A flood/dust abatement grant was secured to begin this process.
2018 update: The City has $125,000 from the Bureau of Indian Affairs (BIA) to be utilized to elevate and reinforce roads; however, this project has not been completed due to the need for additional funding. The BIA funds are for projects FLD-2 and FLD-4.

FLD-3. Relocate existing and new public safety facilities to areas above the 100-year floodplain. (Goals 1, 2)
Areas have been set aside in the ridge area (near the school and Togiak Heights subdivision) for public safety facilities where they will not be impacted by flood hazards.
2018 update: The cost to relocate existing and new public safety facilities is approximately $2 million. This project has not been completed due to lack of funding.

Flooding and Erosion Mitigation Action Plan (Cont'd)

Mitigation Actions
FLD-4. Emergency shelter access route. (Goal 2) A second route for access and egress to the school, which is the community's designated shelter, and the Togiak Heights subdivision is needed. It is important that all areas of the community have access to the shelter. A direct route past the pump house is envisioned. **2018 update**: As with project FLD-2, the City has $125,000 from BIA to assist in constructing a second route; however, this project has not been completed due to the need for additional funding.
FLD-5. Improve drainage in Togiak. (Goals 1, 2) Storms and snowmelt both cause flooding in the community. Improved drainage could keep standing water off streets, reducing damage to infrastructure, and facilitating movement of residents and emergency services throughout the community. **2018 update**: This project has not been completed due to lack of funding.

Flooding and Erosion Mitigation Action Plan (Cont'd)

Mitigation Actions
FLD-6. Suite of emergency plans. (Goals 2, 3) To facilitate preparedness, the community's Emergency Operations Plan should be updated and tailored to the community's specific needs. Other emergency plans could include emergency evacuation and continuity of operations planning. **2018 update**: This project is currently in progress. Training/drills have been conducted twice with important lessons learned (two people were injured during drills).
FLD-7. Public education. (Goal 3) Increase public knowledge about mitigation opportunities, floodplain functions, emergency service procedures, and potential hazards. This would include advising property owners, potential property owners, and visitors about potential hazards. In addition, dissemination of a brochure or flyer on flood hazards in Togiak could be developed and distributed to all households. **2018 update**: Public education has been lacking; however, the schools implement drills, and students disseminate the information to their family members.

Flooding and Erosion Mitigation Action Plan (Cont'd)

Mitigation Actions
FLD-8. Togiak Flood Plain Maps. (Goal 1, 2) Accurate flood maps that delineate areas of flooding and upland areas should be prepared. **2018 update**: Flood maps were completed. FIRMs for Togiak were effective as of February 2010.
FLD-9: Flood Insurance. (Goals 1, 2) Continue to obtain flood insurance for all City structures, and continue compliance with the NFIP. **2018 update**: This project remains ongoing.

Severe Weather – Hazard Profile Overview

- Severe weather for Togiak includes:
  - Winter Storms
  - Heavy Snow
  - Freezing Rain/Ice Storm
  - Extreme Cold
- The most recent major storm event occurred in 2015; high wind damaged the seawall.
- Severe weather has a “highly likely” probability of occurring within the next 3 years with a “critical” extent of impacts.

Severe Weather Mitigation Action Plan

Goal #1: Mitigate the effects of severe weather.
Goal #2: Education and preparedness.
Goal #3: Develop an early warning system.

Mitigation Actions

SW-1. Storm Ready. (Goals 2, 3)
Research and consider instituting the National Weather Service program of "Storm Ready".
Storm Ready is a nationwide community preparedness program that uses a grassroots approach to help communities develop plans to handle all types of severe weather—from tornadoes to tsunamis. The program encourages communities to take a new, proactive approach to improving local hazardous weather operations by providing emergency managers with clear-cut guidelines on how to improve their hazardous weather operations.
2018 update: This remains a high priority project; however, it has yet to be implemented.

Severe Weather Mitigation Action Plan (Cont'd)

Mitigation Actions
SW-2. Education and preparedness activities. (Goal 2) Conduct special awareness activities, such as Winter Weather Awareness Week, Flood Awareness Week, etc., in the school and with the general public. **2018 update**: Progress on this project has been lacking; however, schools implement drills and information is disseminated from students to their family members.
SW-3. NOAA Weather Radio. (Goal 2) Expand public awareness about NOAA Weather Radio for continuous weather broadcasts and warning tone alert capability. **2018 update**: This project has not been implemented.

Severe Weather Mitigation Action Plan (Cont'd)

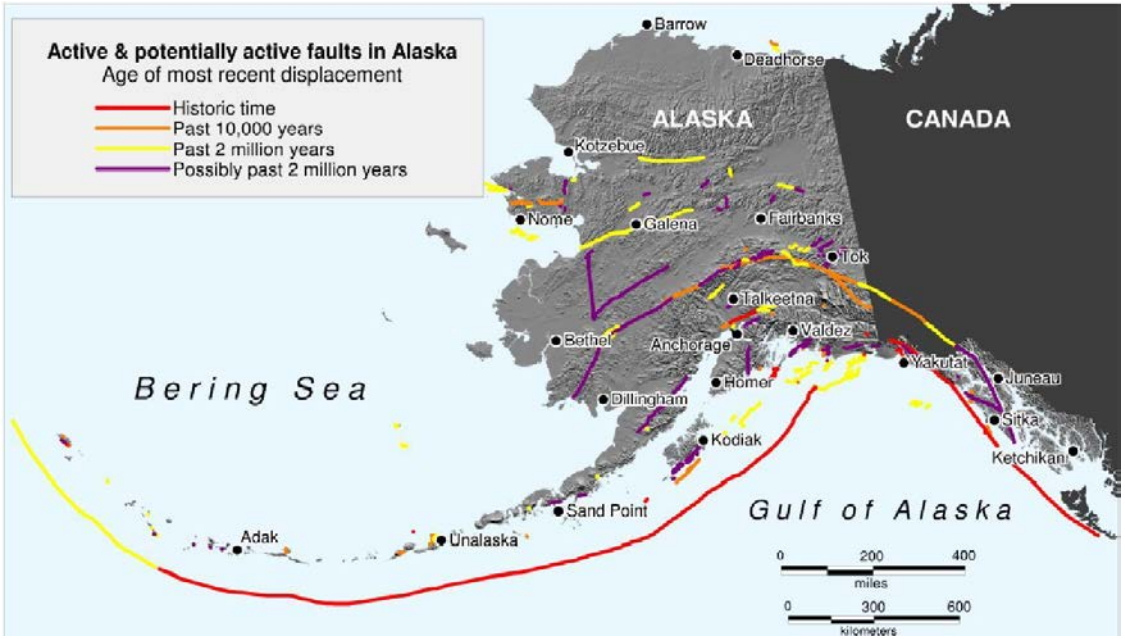
Mitigation Actions

SW-4. Encourage weather-resistant building construction materials and practices. (Goal 1)

Homes, businesses, and public buildings that are built to be weather-resistant have lower maintenance and utility costs, suffer less weather-related damage, and are more comfortable in Alaska's harsh weather.

2018 update: This project remains ongoing. All new construction, to include the water plant, sewer lift station, City office, and school will be or are built to be weather-resistant.

Earthquake – Hazard Profile Overview



- Togiak has never experienced earthquake damage.
- Impact of earthquakes on Togiak is considered "negligible"
- Probability of severe earthquakes occurring in the future is unlikely, with less than 10% chance of occurring.

Earthquake Mitigation Action Plan

Goal #1: Mitigate against earthquake damage.

Mitigation Actions
E-1. Identify critical facilities. Identify buildings and facilities that must be able to remain operable during and following an earthquake event. **2018 update**: Seismic retrofits were identified and completed for the following facilities: water plant, sewer lift stations, school, and City office.
E-2: Assess the structural integrity of critical facilities and infrastructure. Perform an engineering assessment of the earthquake vulnerability of each identified critical infrastructure owned by the City of Togiak. **2018 update**: This project was completed in 2014 and accrued approximately $1.8 million in consulting fees.

Earthquake Mitigation Action Plan (Cont'd)

Mitigation Actions

E-3. Nonstructural Mitigation Projects.
Assess facilities and improve earthquake preparedness through such measures as installing bookshelf tie-downs, improving computer servers' resistance to earthquakes, and moving heavy objects to lower
shelves, etc.
2018 update: Nonstructural mitigation projects have been completed at the school.

Volcano – Hazard Profile Overview

- Togiak has never experienced volcano-eruption-related damage.
- Impact of volcanoes on Togiak is considered “limited”
- Probability of volcanic-eruption-related events occurring in the future is likely, with less than 33% chance of occurring.

Volcano Mitigation Action Plan

Goal #1: Mitigate against volcano damage.

Mitigation Actions
V-1. Public Education and Preparedness. Coordinate with aviation entities to share information and advanced warning of volcanic eruption hazards. Publish and distribute guide to volcano preparedness. **2018 update**: The school educates its students who then disseminate the information to their family members.

Climate Change – Hazard Profile Overview

- Residents noted the following impacts:
  - Warmer winters;
  - Less sea ice to protect the shoreline during fall/winter storms; and
  - Impacts on the fall moose season.
- What are other ways climate change is affecting Togiak?

Take Action

- Remember the HMP is a plan. It is ultimately the responsibility of the community to initiate projects and seek out funding.
- The HMP should be also referenced and incorporated into other community planning mechanisms to create a cohesive strategy for future actions.

Keeping the HMP Current

- Perform annual reviews using the review sheet in Appendix E of plan
- Gather public information about hazards using survey in Appendix E of plan
- Initiate HMP update process before 2022

Questions/comments about the HMP Update

If you have any questions/comments about the HMP or its update please contact the planning team:

Mayor Anna May Kasak
Darryl Thompson
Anecia Kritz

They can forward all questions to the relevant entity.

LeMay Engineering & Consulting, Inc.

Patrick M. LeMay, P.E.
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Anchorage, AK 99504
(907) 250-9038
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March 1, 2018

Brent A. Nichols, EMSII, CFM
Emergency Management Specialist II & Certified Floodplain Manager
Department of Military and Veterans Affairs
Division of Homeland Security and Emergency Management
P.O. Box 5750
JBER, AK 99505-5750

Subject: **Hazard Mitigation Plan Public Hearing**
City of Togiak, Alaska

On February 26, 2018, John Farr, EIT of LeMay Engineering & Consulting, Inc. traveled to Togiak, Alaska. The purposes of this trip were to update the Togiak City Council, to give a public presentation about the City's Hazard Mitigation Plan (HMP), and to take public comments on the draft of the updated HMP. Due to weather delaying flights, the meeting had to be rescheduled from the evening of February 26 to the evening of February 27. Notice of the Public Meeting was advertised on the bulletin boards around the City and announced over the VHF radio. Community members responded to the invitations by calling the City and asking if door prizes would be given out at the meeting.

The Public Meeting was held at 7 pm on February 27 in the City office. The Mayor of Togiak, City Administrator, City Clerk, five City Council members, and one community member were in attendance. Comments were primarily provided by the Mayor, City Administrator, and City Council members. The comments included suggested revisions to the climate change hazard profile, additional updates for multiple flooding mitigation actions, a new mitigation action for climate change, and information about other hazards that may face the community in the future.

The revisions to the climate change hazard profile included additional local impacts, including more frequent lightning storms, drier summers, and smaller snowdrifts. The revisions to the mitigation action updates included adding information about the City's organization for evacuation in the event of a flood and the City's progress toward roadway improvements. It was suggested that Public Education be added as a mitigation action for climate change. Additionally, those attending the meeting stated concerns that the wildfire and landslide risk may increase in the community as development moves into hilly and wooded regions, and as climate change results in conditions that exacerbate these events. The meeting was productive and resulted in many improvements to the draft HMP.

If you have any questions, please do not hesitate to call me at (907) 250-9038.

03/01/18
Patrick M. LeMay, P.E./Date
LeMay Engineering & Consulting, Inc.

Appendix B
Adoption Resolution

Appendix C: FEMA Review Tool

APPENDIX A:
LOCAL MITIGATION PLAN REVIEW TOOL

The *Local Mitigation Plan Review Tool* demonstrates how the Local Mitigation Plan meets the regulation in 44 CFR §201.6 and offers States and FEMA Mitigation Planners an opportunity to provide feedback to the community.

- The Regulation Checklist provides a summary of FEMA's evaluation of whether the Plan has addressed all requirements.
- The Plan Assessment identifies the plan's strengths as well as documents areas for future improvement.
- The Multi-jurisdiction Summary Sheet is an optional worksheet that can be used to document how each jurisdiction met the requirements of the each Element of the Plan (Planning Process; Hazard Identification and Risk Assessment; Mitigation Strategy; Plan Review, Evaluation, and Implementation; and Plan Adoption).

The FEMA Mitigation Planner must reference this *Local Mitigation Plan Review Guide* when completing the *Local Mitigation Plan Review Tool*.

Jurisdiction:	**Title of Plan:**	**Date of Plan:**
Togiak, Alaska (Region 10)	The City of Togiak Hazard Mitigation Plan Update	March 3, 2018

Local Point of Contact: Darryl Thompson	**Address:** City of Togiak P.O. Box 190 Togiak, AK 99678
Title: City Administrator	
Agency: City of Togiak	
Phone Number: (907) 493-2087	**E-Mail:** togwater@hushmail.com, cityoftogiak@outlook.com

State Reviewer:	**Title:**	**Date:**
Mike Johnson	Mitigation Planner	October 30, 2018

FEMA Reviewer:	**Title:**	**Date:**
Amanda Siok Amanda.Siok@fema.dhs.gov	Mitigation Planner	05/14/2018
Kate Skaggs Kate.Skaggs@mbakerintl.com	Mitigation Planner	11/12/2018
Date Received in FEMA Region 10	03/28/2018	
Plan Not Approved		
Plan Approvable Pending Adoption	11/12/2018	
Plan Approved	02/12/2019	

SECTION 1:
REGULATION CHECKLIST

1. REGULATION CHECKLIST **Regulation** (44 CFR 201.6 Local Mitigation Plans)	Location in Plan (section and/or page number)	Met	Not Met
ELEMENT A. PLANNING PROCESS			
A1. Does the Plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? (Requirement §201.6(c)(1))	PDF 12-15, 95-127	X	
A2. Does the Plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development as well as other interests to be involved in the planning process? (Requirement §201.6(b)(2))	PDF 13-14, 100	X	
A3. Does the Plan document how the public was involved in the planning process during the drafting stage? (Requirement §201.6(b)(1))	PDF 14-15, 95-127	X	
A4. Does the Plan describe the review and incorporation of existing plans, studies, reports, and technical information? (Requirement §201.6(b)(3))	PDF 13	X	
A5. Is there discussion of how the community(ies) will continue public participation in the plan maintenance process? (Requirement §201.6(c)(4)(iii))	PDF 17, 152-156	X	
A6. Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a 5-year cycle)? (Requirement §201.6(c)(4)(i))	PDF 16-17, 148-156	X	
ELEMENT A: REQUIRED REVISIONS			

1. REGULATION CHECKLIST **Regulation** (44 CFR 201.6 Local Mitigation Plans)	Location in Plan (section and/or page number)	Met	Not Met
ELEMENT B. HAZARD IDENTIFICATION AND RISK ASSESSMENT			
B1. Does the Plan include a description of the type, location, and extent of all-natural hazards that can affect each jurisdiction(s)? (Requirement §201.6(c)(2)(i))	PDF 43-67	X	
B2. Does the Plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))	PDF 45-46, 54-55, 59-60, 64, 66	X	
B3. Is there a description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii))	PDF 21-25, 39-42, 46, 54, 59, 64, 66	X	
B4. Does the Plan address NFIP insured structures within the jurisdiction that have been repetitively damaged by floods? (Requirement §201.6(c)(2)(ii))	PDF 41, 47-49	X	
ELEMENT B: REQUIRED REVISIONS			

ELEMENT C. MITIGATION STRATEGY			
C1. Does the plan document each jurisdiction's existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs? (Requirement §201.6(c)(3))	PDF 28-30	X	
C2. Does the Plan address each jurisdiction's participation in the NFIP and continued compliance with NFIP requirements, as appropriate? (Requirement §201.6(c)(3)(ii))	PDF 47-79	X	
C3. Does the Plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards? (Requirement §201.6(c)(3)(i))	PDF 49, 55, 60, 64, 67	X	
C4. Does the Plan identify and analyze a comprehensive range of specific mitigation actions and projects for each jurisdiction being considered to reduce the effects of hazards, with emphasis on new and existing buildings and infrastructure? (Requirement §201.6(c)(3)(ii))	PDF 49-51, 55-56, 61, 64-65, 67	X	
C5. Does the Plan contain an action plan that describes how the actions identified will be prioritized (including cost benefit review), implemented, and administered by each jurisdiction? (Requirement §201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))	PDF 75-81, 144-145	X	
C6. Does the Plan describe a process by which local governments will integrate the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate? (Requirement §201.6(c)(4)(ii))	PDF 15-16	X	

ELEMENT C: REQUIRED REVISIONS

1. REGULATION CHECKLIST **Regulation** (44 CFR 201.6 Local Mitigation Plans)	Location in Plan (section and/or page number)	Met	Not Met
ELEMENT D. PLAN REVIEW, EVALUATION, AND IMPLEMENTATION (applicable to plan updates only)			
D1. Was the plan revised to reflect changes in development? (Requirement §201.6(d)(3))	PDF 42	X	
D2. Was the plan revised to reflect progress in local mitigation efforts? (Requirement §201.6(d)(3))	PDF 49-51, 55-56, 61, 64-65, 67	X	
D3. Was the plan revised to reflect changes in priorities? (Requirement §201.6(d)(3))	PDF 74, 75-81	X	
ELEMENT D: REQUIRED REVISIONS			
ELEMENT E. PLAN ADOPTION			
E1. Does the Plan include documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval? (Requirement §201.6(c)(5))		X	
E2. For multi-jurisdictional plans, has each jurisdiction requesting approval of the plan documented formal plan adoption? (Requirement §201.6(c)(5))	N/A		
ELEMENT E: REQUIRED REVISIONS			
ELEMENT F. ADDITIONAL STATE REQUIREMENTS (OPTIONAL FOR STATE REVIEWERS ONLY; NOT TO BE COMPLETED BY FEMA)			
F1.			
F2.			
ELEMENT F: REQUIRED REVISIONS			

SECTION 2:
PLAN ASSESSMENT

A. Plan Strengths and Opportunities for Improvement

This section provides a discussion of the strengths of the plan document and identifies areas where these could be improved beyond minimum requirements.

Element A: Planning Process

Plan Strengths:

- How fortuitous that the community leaders were heading to ANC near the meeting time. The airport may not have been the best option but winter travel in Alaska brings with it challenges. Good thinking to get the meeting done with limited time/resources!
- The community was engaged in the public meeting and provided significant input on mitigation progress and climate change impacts.
- Public presentation Feb 26, 2018. It appears word got out through several mediums and had public interest if something was provided. This highlights a trend of what can be viewed as a bridge to attain public participation. Some communities have discussed with DHS&EM that a monetary exchange should be made for public input.
- The plan includes a public survey and will utilize the annual spring clean-up event to engage the public.

Opportunities for Improvement:

- Consider inviting nearby communities and other state and local partners to engage in the planning process. Consider the local clinic, school staff, housing authority, fish and wildlife, etc.

Element B: Hazard Identification and Risk Assessment

Plan Strengths:

- The plan clearly identifies vulnerable populations, infrastructure, and essential facilities in the capability section.
- The plan includes identification of cultural and historical assets, atypical but valuable information in a non-tribal plan.
- Mitigation goals, actions, and status updates are provided in the same section as the hazard profile.
- The plan addresses that wildfire hazards should be profiled in future updates as a result of climate change.

Opportunities for Improvement:

- The summary impact statements on PDF 41-42 are generic and not specific to the identified infrastructure or locations of hazards and vulnerabilities in Togiak. Consider revising these sections to be specific to damages and/or scenarios that Togiak may experience.
- The previous occurrence sections are weak. Consider describing what the resulting impacts of the event were and use those impacts to support development of mitigation strategies.
- The proposed mitigation actions for climate change hazards do not address the locally experienced impacts (which include warmer winters, drier summers, increased erosion rates, reduction in winter snow, and increased wildfires as a result of increased lightning). Mitigation strategies should address the impacts; consider adding strategies such as “assess local homes and infrastructure for compliance with defensible space” or “reduce wildfire vulnerabilities by becoming a Firewise community”. Additional strategies could support coping with hotter summers such as AC for vulnerable populations, housing construction that is more insulated, etc.

Element C: Mitigation Strategy

Plan Strengths:

Opportunities for Improvement:

- Consider creative options for streamlining resources and existing planning process. While the Healthy Community Plan and Emergency Plans do not directly overlap with the HMP, consider how natural hazards may impact emergency services, evacuation plans, or which community assets should be protected to ensure goals in the Healthy Community Plan and Comprehensive Plan. Alternatively, consider ways of aligning public or staff meetings for all three plans that may involve the same people.

Element D: Plan Update, Evaluation, and Implementation (*Plan Updates Only*)

Plan Strengths:

Opportunities for Improvement:

B. Resources for Implementing Your Approved Plan

The **Region 10 Integrating Natural Hazard Mitigation into Comprehensive Planning** is a resource specific to Region 10 states and provides examples of how communities are integrating natural hazard mitigation strategies into comprehensive planning. You can find it in the FEMA Library at http://www.fema.gov/media-library/assets/documents/89725.

The **Integrating Hazard Mitigation Into Local Planning: Case Studies and Tools for Community Officials** resource provides practical guidance on how to incorporate risk reduction strategies into existing local plans, policies, codes, and programs that guide community development or redevelopment patterns. It includes recommended steps and tools to assist with local integration efforts, along with ideas for overcoming possible impediments, and presents a series of case studies to demonstrate successful integration in practice. You can find it in the FEMA Library at http://www.fema.gov/library/viewRecord.do?id=7130.

The **Mitigation Ideas: A Resource for Reducing Risk from Natural Hazards** resource presents ideas for how to mitigate the impacts of different natural hazards, from drought and sea level rise, to severe winter weather and wildfire. The document also includes ideas for actions that communities can take to reduce risk to multiple hazards, such as incorporating a hazard risk assessment into the local development review process. You can find it in the FEMA Library at http://www.fema.gov/library/viewRecord.do?id=6938.

The **Local Mitigation Planning Handbook** provides guidance to local governments on developing or updating hazard mitigation plans to meet and go above the requirements. You can find it in the FEMA Library at http://www.fema.gov/library/viewRecord.do?id=7209.

The **Integration Hazard Mitigation and Climate Adaptation Planning: Case Studies and Lessons Learned** resource is a 2014 ICLEI publication for San Diego with a clear methodology that could assist in next steps for integration impacts of climate change throughout mitigation actions. http://icleiusa.org/wp-content/uploads/2015/08/Integrating-Hazard-Mitigation-and-Climate-Adaptation-Planning.pdf

The **Local Mitigation Plan Review Guide and Tool** resource is available through FEMA's Library and should be referred to for the next plan update. http://www.fema.gov/library/viewRecord.do?id=4859

The **Tribal Multi-Hazard Mitigation Planning Guidance:** This resource is specific to tribal governments developing or updating tribal mitigation plans. It covers all aspects of tribal planning requirements and the steps to developing tribal mitigation plans. You can find the document in the FEMA Library at http://www.fema.gov/media-library/assets/documents/18355

Volcanic Eruption Mitigation Measures: For information on Mitigation Actions for Volcanic Eruptions that would satisfy the C4 requirement, please visit:

http://earthzine.org/2011/03/21/volcanic-crisis-management-and-mitigation-strategies-a-multi-risk-framework-case-study/ and http://www.gvess.org/publ.html.

The FEMA Region 10 **Risk Mapping, Analysis, and Planning program (Risk MAP)** releases a monthly newsletter that includes information about upcoming events and training opportunities, as well as hazard and risk related news from around the Region. Past newsletters can be viewed at http://www.starr-team.com/starr/RegionalWorkspaces/RegionX/Pages/default.aspx. If you would like to receive future newsletters, email rxnewsletter@starr-team.com and ask to be included.

The mitigation strategy may include eligible projects to be funded through FEMA's hazard mitigation grant programs (Pre-Disaster Mitigation, Hazard Mitigation Grant Program, and Flood Mitigation Assistance). Contact your State Hazard Mitigation Officer, Brent Nichols at Brent.Nichols@alaska.gov, for more information.

Appendix D: Cost-Benefit Analysis

Benefit-Cost Analysis Fact Sheet

Hazard mitigation projects are specifically aimed at reducing or eliminating future damages. Although hazard mitigation projects may sometimes be implemented in conjunction with the repair of damages from a declared disaster, the focus of hazard mitigation projects is on strengthening, elevating, relocating, or otherwise improving buildings, infrastructure, or other facilities to enhance their ability to withstand the damaging impacts of future disasters. In some cases, hazard mitigation projects may also include training or public-education programs if such programs can be demonstrated to reduce future expected damages.

A Benefit-Cost Analysis (BCA) provides an estimate of the "benefits" and "costs" of a proposed hazard mitigation project. The benefits considered are avoided future damages and losses that are expected to accrue as a result of the mitigation project. In other words, benefits are the reduction in expected future damages and losses (i.e., the difference in expected future damages before and after the mitigation project). The costs considered are those necessary to implement the specific mitigation project under evaluation. Costs are generally well determined for specific projects for which engineering design studies have been completed. Benefits, however, must be estimated probabilistically because they depend on the improved performance of the building or facility in future hazard events, the timing and severity of which must be estimated probabilistically.

All Benefit-Costs must be:

- Credible and well documented
- Prepared in accordance with accepted BCA practices
- Cost-effective (BCR $\geq$ 1.0)

General Data Requirements:

- All data entries (other than Federal Emergency Management Agency [FEMA] standard or default values) MUST be documented in the application.
- Data MUST be from a credible source.
- Provide complete copies of reports and engineering analyses.
- Detailed cost estimate.
- Identify the hazard (flood, wind, seismic, etc.).
- Discuss how the proposed measure will mitigate against future damages.
- Document the Project Useful Life.
- Document the proposed Level of Protection.
- The Very Limited Data (VLD) BCA module cannot be used to support cost-effectiveness (screening purposes only).
- Alternative BCA software MUST be approved in writing by FEMA HQ and the Region prior to submittal of the application.

Damage and Benefit Data

- Well documented for each damage event.
- Include estimated frequency and method of determination per damage event.
- Data used in place of FEMA standard or default values MUST be documented and justified.

- The Level of Protection MUST be documented and readily apparent.
- When using the Limited Data (LD) BCA module, users cannot extrapolate data for higher frequency events for unknown lower frequency events.

Building Data

- Should include FEMA Elevation Certificates for elevation projects or projects using First Floor Elevations (FFEs).
- Include data for building type (tax records or photos).
- Contents claims that exceed 30 percent of building replacement value (BRV) MUST be fully documented.
- Method for determining BRVs MUST be documented. BRVs based on tax records MUST include the multiplier from the County Tax Assessor.
- Identify the amount of damage that will result in demolition of the structure (FEMA standard is 50 percent of pre-damage structure value).
- Include the site location (i.e., miles inland) for the Hurricane module.

Use Correct Occupancy Data

- Design occupancy for Hurricane shelter portion of Tornado module.
- Average occupancy per hour for the Tornado shelter portion of the Tornado module.
- Average occupancy for Seismic modules.

Questions to Be Answered

- Has the level of risk been identified?
- Are all hazards identified?
- Is the BCA fully documented and accompanied by technical support data?
- Will residual risk occur after the mitigation project is implemented?

Common Shortcomings

- Incomplete documentation.
- Inconsistencies among data in the application, BCA module runs, and the technical support data.
- Lack of technical support data.
- Lack of a detailed cost estimate.
- Use of discount rate other than FEMA-required amount of 7 percent.
- Overriding FEMA default values without providing documentation and justification.
- Lack of information on building type, size, number of stories, and value.
- Lack of documentation and credibility for FFEs.
- Use of incorrect Project Useful Life (not every mitigation measure = 100 years).

Appendix E

Plan Maintenance Documents

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Annual Review Questionnaire

PLAN SECTION	QUESTIONS	YES	NO	COMMENTS
PLANNING PROCESS	Are there internal or external organizations and agencies that have been invaluable to the planning process or to mitigation action			
	Are there procedures (e.g., meeting announcements, plan updates) that can be done more efficiently?			
	Has the Task Force undertaken any public outreach activities regarding the MHMP or implementation of mitigation actions?			
HAZARD PROFILES	Has a natural and/or human-caused disaster occurred in this reporting period?			
	Are there natural and/or human-caused hazards that have not been addressed in this HMP and should be?			
	Are additional maps or new hazard studies available? If so, what have they revealed?			
VULNERABILITY ANALYSIS	Do any new critical facilities or infrastructure need to be added to the asset lists?			
	Have there been changes in development patterns that could influence the effects of hazards or create additional risks?			
MITIGATION STRATEGY	Are there different or additional resources (financial, technical, and human) that are now available for mitigation planning within the			
	Are the goals still applicable?			
	Should new mitigation actions be added to the a community's Mitigation Action Plan?			
	Do existing mitigation actions listed in a community's Mitigation Action Plan need to be reprioritized?			
	Are the mitigation actions listed in a community's Mitigation Action Plan appropriate for available resources?			

Mitigation Action Progress Report

Progress Report Period: _____ (date) to _____ (date)

Project Title: _____ Project ID# _____

Responsible Agency: _____

Address: _____

City: _____

Contact Person: _____ Title: _____

Phone #(s): _____ email address: _____

List Supporting Agencies and Contacts:

_____

_____

Total Project Cost: _____

Anticipated Cost Overrun/Underrun: _____

Date of Project Approval: _____ Start date of the project: _____

Anticipated completion date: _____

Description of the Project (include a description of each phase, if applicable, and the time frame for completing each phase): _____

_____

_____

_____

Milestones	Complete	Projected Date of Completion

Plan Goal (s) Addressed:

Goal: _____

Indicator of Success: _____

Project Status

☐ Project on schedule

☐ Project completed

☐ Project delayed*

*explain: _____

☐ Project canceled

Project Cost Status

☐ Cost unchanged

☐ Cost overrun*

*explain: _____

☐ Cost underrun*

*explain: _____

Summary of progress on project for this report:

A. What was accomplished during this reporting period?

B. What obstacles, problems, or delays did you encounter, if any?

C. How was each problem resolved?

Next Steps: What is/are the next step(s) to be accomplished over the next reporting period?

Other Comments:

Community Local Hazard Mitigation Plan Survey

This survey is an opportunity for you to share your opinions and participate in the mitigation planning process. The information that you provide will help us better understand your concerns for hazards and risks, which could lead to mitigation activities that will help reduce those risks and the impacts of future hazard events.

The hazard mitigation process is not complete without your feedback. All individual responses are strictly confidential and will be used for mitigation planning purposes only.

Please help us by taking a few minutes to complete this survey and return it to:

City Administrator, Togiak

Vulnerability Assessment

The following questions focus on how vulnerable the community or its facilities are to damage from a particular hazard type using the following vulnerability scale:

0= Don't Know 1 =Minimally Vulnerable 2=Moderately Vulnerable 3=Severely Vulnerable

1. How vulnerable to damage are the *structures* in the community from:

a. Flooding?	0 1 2 3
b. Wildfire?	0 1 2 3
C. Earthquakes?	0 1 2 3
d. Volcanoes?	0 1 2 3
e. Snow Avalanche?	0 1 2 3
f. Tsunami/Seiches?	0 1 2 3
g. Severe weather storms?	0 1 2 3
h. Ground failure (landslide, permafrost)?	0 1 2 3
i. Coastal erosion?	0 1 2 3
j. Climate change?	0 1 2 3
k. Other hazards?	0 1 2 3
Please Specify:	

2. How vulnerable to damage are the *critical facilities* within our community from:

[Critical facilities include airport, community shelter, bulk fuel storage tanks, generators, health clinic, law enforcement office (VPO, VPSO, police department), school, public works, e.g. washeteria/water treatment, reservoir/water supply, satellite dish, communications tower, landfills, sewage lagoons, and stores.]

a. Flooding?	0 1 2 3
b. Wildfire?	0 1 2 3
C. Earthquakes?	0 1 2 3
d. Volcanoes?	0 1 2 3
e. Snow Avalanche?	0 1 2 3
f. Tsunami/Seiches?	0 1 2 3
g. Severe weather storms?	0 1 2 3
h. Ground failure (landslide, permafrost)?	0 1 2 3
i. Coastal erosion?	0 1 2 3
j. Climate change?	0 1 2 3
k. Other hazards?	0 1 2 3

Please Specify:

3. How vulnerable to displacement, evacuation or life-safety is the community from:

a. Flooding?	0 1 2 3
b. Wildfire?	0 1 2 3
C. Earthquakes?	0 1 2 3
d. Volcanoes?	0 1 2 3
e. Snow Avalanche?	0 1 2 3
f. Tsunami/Seiches?	0 1 2 3
g. Severe weather storms?	0 1 2 3
h. Ground failure (landslide, permafrost)?	0 1 2 3
i. Coastal erosion?	0 1 2 3
j. Climate change?	0 1 2 3
k. Other hazards?	0 1 2 3

Please Specify:

4. Do you have a record of damages incurred during past flood events? Yes No

If yes, please describe:_____

_____

_____

Preparedness

Preparedness activities are often the first line of defense for protection of your family and the community. In the following list, please check those activities that you have done, plan to do in the near future, have not done, or are unable to do. *Please check one answer for each preparedness activity*.

Have you or someone in your household:	Have Done	Plan to do	Not Done	Unable to do
Attended meetings or received written information on natural disasters or emergency preparedness?	☐	☐	☐	☐
Talked with family members about what to do in case of a disaster or emergency?	☐	☐	☐	☐
Made a "Household/Family Emergency Plan" in order to decide what everyone would do in the event of a disaster?	☐	☐	☐	☐
Prepared a "Disaster Supply Kit" extra food, water, medications, batteries, first aid items, and other emergency supplies)?	☐	☐	☐	☐
In the last year, has anyone in your household been trained in First Aid or CPR?	☐	☐	☐	☐

5. Would you be willing to make your home more resistant to natural disasters? ☐ Yes ☐ No

6. Would you be willing to spend more money on your home to make it more disaster resistant? ☐ Yes ☐ No ☐ Don't know

7. How much are you willing to spend to better protect your home from natural disasters? *(Check only one)*

☐	Less than $100	☐	Desire to relocate for protection
☐	$100-$499	☐	Other, please explain
☐	$500 and above		
☐	Nothing / Don't know		
☐	Whatever it takes		

Mitigation Activities

A component of the Local Hazard Mitigation Plan activities is developing and documenting additional mitigation strategies that will aid the community in protecting life and property from the impacts of future natural disasters.

Mitigation activities are those types of actions you can take to protect your home and property from natural hazard events such as floods, severe weather, and wildfire. Please check the box for the following statements to best describe their importance to you. Your responses will help us determine your community's priorities for planning for these mitigation activities.

Statement	Very Important	Somewhat Important	Neutral	Not Very Important	Not Important
Protecting private property	☐	☐	☐	☐	☐
Protecting critical facilities (clinic, school, washeteria, police/fire department, water/sewer, landfill)	☐	☐	☐	☐	☐
Preventing development in hazard areas	☐	☐	☐	☐	☐
Protecting natural environment	☐	☐	☐	☐	☐
Protecting historical and cultural landmarks	☐	☐	☐	☐	☐
Promoting cooperation within the community	☐	☐	☐	☐	☐
Protecting and reducing damage to utilities, roads, or water tank	☐	☐	☐	☐	☐
Strengthening emergency services (clinic workers, police/fire)	☐	☐	☐	☐	☐

8. Do you have other suggestions for possible mitigation actions/strategies?

_____

_____

_____

_____

_____

General Household Information

9. Please indicate your age: _____

and Gender: ☐ Male ☐ Female

10. Please indicate your level of education:

☐	Grade school/no schooling	☐	College degree
☐	Some high school	☐	Postgraduate degree
☐	High school graduate/GED	☐	Other, please specify
☐	Some college/trade school		

11. How long have you lived in Togiak?

☐ Less than 5 years ☐ 5 to 10 years ☐ 11 to 20 years ☐ 21 or more years

12. Do you have internet access? ☐ Yes ☐ No

13. Do you own or rent your home? ☐ Own ☐ Rent

If you have any questions regarding this survey or would like to learn about other ways that you can participate in the development of the Local Hazard Mitigation Plan, please contact the City Administrator.

Thank You for Your Participation!

This survey may be submitted anonymously; however, if you provide us with your name and contact information below we will have the ability to follow up with you to learn more about your ideas or concerns (optional):

Name: _____

Address: _____

_____

Phone: _____