



*Photo Credit: Steve Ivanoff*



**Background Planning Report**

**Shaktoolik Strategic  
Management Plan**

*Shaktoolik, Alaska*

**July 17, 2015**

**DRAFT**

## Strategic Management Plan: Background Report

DRAFT issued for review by the Native Village of Shaktoolik and the Shaktoolik Interagency Working Group. Prepared by HDR with RIM First People for the State of Alaska  
Department of Commerce, Community, and Economic Development  
Division of Community and Regional Affairs

This report is funded with qualified outer continental shelf oil and gas revenues by the Coastal Impact Assistance Program, U.S. Department of the Interior, U.S. Fish and Wildlife Service.

### **DCCED Project Manager:**

Sally Russell Cox, Planner  
Division of Community and Regional Affairs

### **Community Coordinator:**

Michael Sookiyak, Sr., Native Village of Shaktoolik

### **Editorial contributions from:**

To be completed later

With special acknowledgement to the residents of Shaktoolik and the community leadership.

<b>City of Shaktoolik</b>	<b>Native Village of Shaktoolik</b>	<b>Shaktoolik Native Corporation</b>
Edgar Jackson Sr.	Teresa Sockpealuk-Perry	Eugene Asisicksik
Edna Savetilik	Agnes Takak	Tonya Sagoonick
Randall Takak	Matilda Hardy	Ellen Hunt
Gail Evan	Axel Jackson	Michael Sookiyak Sr.
Eugene Asisicksik	Shawn Evan	Teresa Sockpealuk-Perry
Agnes Takak	Edgar Jackson Sr.	Kathy Fagerstrom
Axel Jackson	Edna Savetilik	Betty Jackson

Special thanks to the following organizations for donating door prizes during the May 2015 community gathering:

- Bering Air
- City of Shaktoolik
- Shaktoolik Indian Reorganization Act (IRA) Council
- Shaktoolik Native Corporation
- Norton Sound Health Corporation
- ANICA Native Store

## Table of Contents

1	Introduction .....	1
2	Community Background.....	4
2.1	Location.....	4
2.2	Access.....	5
2.3	Government .....	5
2.4	Population and Economy .....	5
2.5	Infrastructure – Housing, Utilities, and Services.....	6
2.6	Climate .....	7
3	Why Develop a Strategic Management Plan? .....	7
1.	Establish a Unified Vision .....	8
2.	Create a Framework for Future Activities.....	8
3.	Communication.....	8
4.	Relationship Building .....	8
4	Summary of Previous Projects .....	8
a.	Immediate Action Workgroup .....	9
b.	Shaktoolik Flooding Analysis.....	10
c.	Hazard Mapping Project .....	10
d.	Shaktoolik Planning Project .....	10
e.	Storm Surge Monitoring .....	10
f.	Vegetated Berm .....	11
g.	Adaptation Plan.....	11
h.	Other Climate-Related Planning Efforts.....	11
5	Summary of Environmental Considerations .....	12
5.1	Fish and Wildlife.....	12
5.1.1	Birds and Waterfowl .....	12
5.1.2	Terrestrial and Marine Mammals .....	13
5.1.3	Threatened and Endangered Species .....	13
5.1.4	Fish .....	14
5.2	Vegetation.....	14
5.3	Soils .....	15

5.4	Historical and Cultural Resources .....	15
6	Identification of Issues .....	15
6.1	Lack of Capital Funds .....	15
6.2	Lack of Community Infrastructure .....	15
6.3	Community Morale .....	16
6.4	Lack of Housing/Overcrowding .....	16
6.5	Long-term Objective .....	17
6.6	Lack of Refuge .....	17
6.7	Other .....	18
7	Values, Vision Statement, and Guiding Principles .....	18
7.1	Community Values .....	18
7.2	Vision Statement.....	20
7.3	Guiding Principles .....	21
8	Next Steps .....	23
i.	References .....	25

## List of Figures

Figure 1. Planning Process .....	3
Figure 2. Resiliency Relationships .....	4
Figure 3. Location and Vicinity Map.....	5
Figure 4. Population, 1950-2010.....	6
Figure 5. Community Values .....	20

## Appendices

- A. Community Participation Report

## Abbreviations

ADF&G	Alaska Department of Fish and Game
DCCED	Department of Commerce, Community, and Economic Development
DGGS	Division of Geological and Geophysical Surveys
DOT&PF	Alaska Department of Transportation and Public Facilities
DPS	Distinct Population Segment
ESA	Endangered Species List
GAO	Government Accountability Office
IRA	Indian Reorganization Act
NMFS	National Marine Fisheries Council
SMP	Strategic Management Plan
USFWS	U.S. Fish and Wildlife Service

# 1 Introduction

Shaktoolik, a community on the eastern edge of Norton Sound, faces considerable threats from erosion and flooding. The Government Accountability Office (GAO) found that at least 184 of Alaska’s 214 villages have experienced some degree of erosion or flooding (GAO 2003).<sup>1</sup> Government agencies consider Shaktoolik as to be one of four communities in immediate need of relocation (GAO 2009), and the State of Alaska Immediate Action Workgroup included it in the six top-priority communities referenced in this document as “at-risk communities.”<sup>2</sup> A clear plan of action with widespread community and agency support will increase Shaktoolik’s chances of receiving future funding.

Erosion, flooding, and severe storms are a significant concern to the community. Winters in Shaktoolik have been getting shorter and temperatures are increasing. Norton Sound is freezing up later, and so shore ice has also formed later. This shore ice provides an important barrier between the community and fall storms. The lack of shore ice has made the community more vulnerable to the storms. Recent storms have resulted in damage to community infrastructure and erosion at the old village site. During the storms, waves have brought driftwood and other debris into the community. If waves and storm surges increase, it could have a catastrophic impact on Shaktoolik.



A 2011 flooding analysis completed for the community predicted grave consequences from extreme storm events (Sea Grant Alaska 2012).

- **15-year storm:** Debris would likely be pushed into the community.
- **25-year storm:** Sea water would be deposited on the beach side of the community but would not overtop the road. Damage could occur from waves running up the sides of buildings.
- **50-year storm:** Sea water would cross the road and some buildings would be flooded. Damage could occur from waves running up the sides of buildings and battering by debris.
- **100-year storm:** Finished floor elevation of all buildings in the community would be flooded (between 2.9 feet and 7.4 feet).

This *Background Planning Report* is the first product of an 18-month Alaska Community Coastal Protection Project with the Alaska Department of Commerce, Community and Economic Development (DCCED) and the community of Shaktoolik to make Shaktoolik more resilient. The objective of the project is to increase community sustainability and resilience to the impacts of natural hazards while protecting the natural coastal environment. The project is based on the premise that careful planning,

<sup>1</sup> The General Accountability Office (GAO) is an investigative arm of Congress that requested to study erosion and flooding in Alaska villages.

<sup>2</sup> The Immediate Action Workgroup is a workgroup of the Alaska Governor’s Sub-cabinet on Climate Change.

agency collaboration, and strong community leadership are essential to successfully addressing the needs of imperiled communities. The process is shown in Figure 1.

This *Background Planning Report* includes:

- Community Background
- Reasons for Developing a Strategic Management Plan
- Summary of Previous Projects
- Summary of Environmental Considerations
- Identification of Issues
- Mission Statement and Guiding Principles
- Goals and Objectives
- Next Steps

The second product will be a *Strategic Management Plan (SMP)* for Shaktoolik that will provide the “blueprint” for how the community and agencies will proceed over the next 20 years to accomplish the recommended actions the community has decided to take. The process used to develop the *Background Planning Report* and *Strategic Management Plan* is shown in Figure 1.

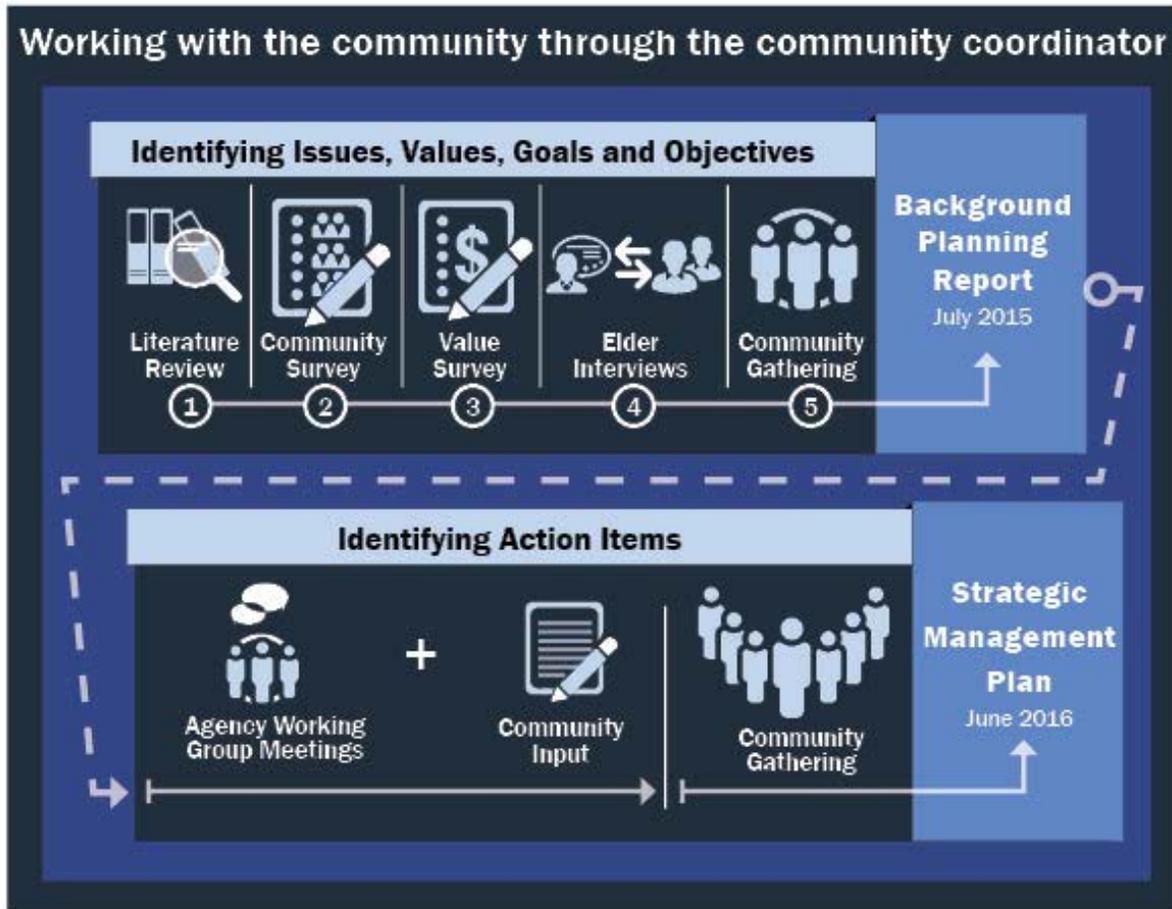
---

*Shaktoolik faces significant risks from natural hazards, especially coastal flooding and erosion. Unlike the nearby communities of Unalakleet and Koyuk, the flat topography surrounding Shaktoolik provides no opportunities for a quick escape to high ground in response to rising waters from a sudden storm surge.*

---

SOURCE: Situation Assessment (Gray et al. 2012)

Figure 1. Planning Process



There is no universal definition of resilience. The term “resilience” has emerged from the field of ecology. It describes the capacity of a system to maintain or recover functionality after a disruption or disturbance. For the purposes of the SMP, the following definition is used (DCCED 2012):

Resilience is the capability to anticipate risk, limit impact, and bounce back rapidly through survival, adaptability, evolution, and growth in the face of turbulent change. A resilient community is not only prepared to help prevent or minimize the loss or damage to life, property and the environment, but also it has the ability to “bounce back”, i.e. quickly return citizens to work, reopen businesses, and restore other essential services needed for a full and swift economic recovery.

Creating a resilient community is not following a series of defined action items; rather, it requires developing a new way of approaching issues. It requires engaging a diverse range of stakeholders such as community residents and government agencies, integrating the planning process across disciplines and levels of government, and coordinating available funding with resilience needs (see Figure 2).

**Figure 2. Resiliency Relationships**



## 2 Community Background

### 2.1 Location

Shaktoolik is located on the east shore of Norton Sound (see Figure 3). It lies 125 miles east of Nome and 33 miles north of Unalakleet on the eastern shore of Norton Sound. Shaktoolik was the first and southernmost Malemiut settlement on Norton Sound, occupied as early as 1839. The village was originally located 6 miles up the Shaktoolik River, and moved to the mouth of the river in 1933. This site was prone to severe storms and winds, however, and the village relocated to its present, more sheltered location in 1967.

Figure 3. Location and Vicinity Map



## 2.2 Access

Shaktoolik is accessible primarily by air and sea. A State-owned 4,000-foot gravel airstrip is available. The airstrip allows for regular service from Unalakleet and Nome. Summer travel is by all-terrain vehicles, motorbikes, trucks, and boats; winter travel is by snowmachine and dog sled. Cargo is barged from Nome and then lightered to shore.

## 2.3 Government

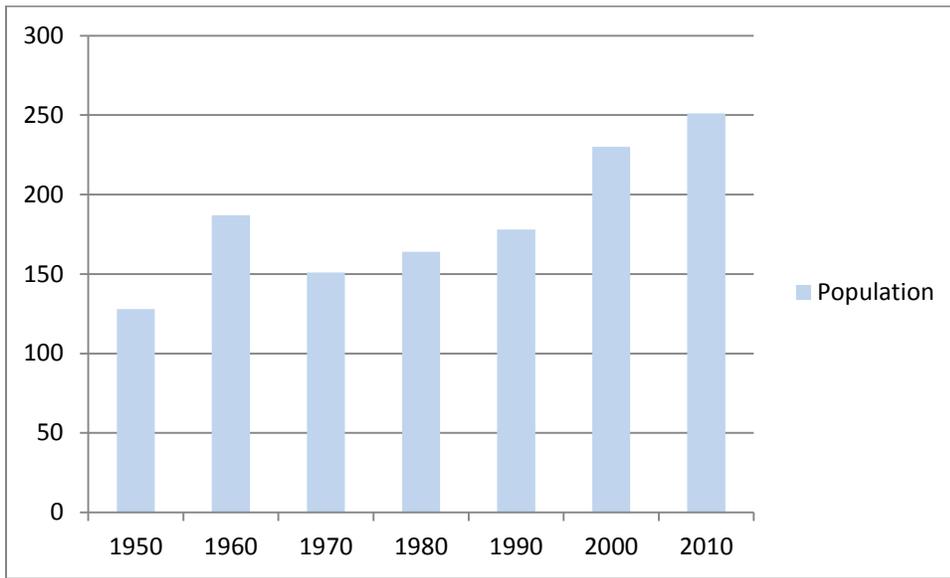
The City of Shaktoolik was incorporated in 1969 as a 2<sup>nd</sup> Class City. The community has a “strong mayor” form of government. Under Alaska Statute Title 29, the City of Shaktoolik assumes powers, including the ability to tax and to administer transportation, police, fire protection, and various other services. The City Council has seven members who meet the first Thursday of every month. Regular elections are held on the first Tuesday in October. The city imposes a 4 percent sales tax.

Shaktoolik is a Malemiut Eskimo village dependent on a subsistence lifestyle. According to Alaska Department of Fish and Game (ADF&G) surveys, the total annual harvest of subsistence foods is about 4.8 million pounds, or about 519 pounds per person, in villages of the Bering Straits Region. Subsistence is an important part of Shaktoolik’s culture.

## 2.4 Population and Economy

According to the 2010 Census, Shaktoolik has a population of 251 residents (U.S. Census Bureau 2010; see Figure 4) and approximately 96 percent of residents are all or part Alaska Native.

**Figure 4. Population, 1950-2010**



Shaktoolik’s economy is based on subsistence and supplemented by part-time employment. Thirty-nine residents hold commercial fishing permits. Development of a new fish-processing facility is a village priority. Reindeer herding also provides income and food.

The total potential work force is 159; 77 residents are employed and 37 adult residents are not in the labor force (not seeking work). The unemployment rate is 23 percent, and according to the 2009-2013 American Community Survey 5-year estimate, 19.6 percent of residents are below the poverty line (U.S. Census Bureau 2013). The per capita income is \$15,054, with a median household income of \$38,750. The Shaktoolik economy is based on subsistence, supplemented by part-time wage earnings.

## 2.5 Infrastructure - Housing, Utilities, and Services

The community has a total of 70 housing units, and 64 units are occupied. A total of six housing units are vacant, and none are vacant due to seasonal use. Thirty-four are owner-occupied and 30 are renter-occupied.

Currently, public facilities in Shaktoolik include the Shaktoolik School, one church, a recreation center, a U.S. Post Office, a community hall, and a village health clinic operated by the Norton Sound Health Corporation.



Shaktoolik has a volunteer fire department. There is currently no Village Public Safety Officer assigned to the community, and law enforcement is through the Alaska State Trooper post in Unalakleet.

Most houses in Shaktoolik have piped water and sewage collection systems. During the summer, water is pumped from the Tagoomenik River, and during the winter, the water source is a river near the Native Store. The water is treated and stored in community water tanks. There is concern that erosion south of the village could allow ocean water from Norton Sound to breach the Tagoomenik River and contaminate the primary water source.

---

*Community infrastructure has been affected by fall storms and later freeze up of sea ice. Past storms have resulted in erosion along the shoreline, the former airstrip south of town, and on either side of the sand spit south of town, including the road which provides access out of town. In addition, storms have damaged buildings and fuel lines.*

---

SOURCE: Situation Assessment (Gray et al. 2012)

The landfill is a Class III unpermitted landfill and does not meet State standards. The location of the dump is a concern, as it could harm the water source. The community is in the process of relocating the landfill to a new site approximately 1.5 miles southeast of the community.

The Alaska Community Electric Cooperative provides electricity through diesel-powered generators and wind turbines. Telephone and internet services are provided by TelAlaska and GCI.

## 2.6 Climate

Shaktoolik is located in a sub-arctic climate with maritime influences. Summer temperatures average between 47 degrees Fahrenheit (°F) and 62°F. Winter temperatures average between -4°F and -11°F. Temperature extremes from -50°F to 87°F have been recorded. The average annual precipitation is 14 inches of rain and 43 inches of snowfall. The Norton Sound is generally ice-free from May to October.



## 3 Why Develop a Strategic Management Plan?

The reasons for producing a SMP include:

## 1. Establish a Unified Vision

With ongoing threats to the community and the long time required to implement solutions, it is important to focus community and partner resources behind a cohesive vision.

## 2. Create a Framework for Future Activities

The SMP will function as an overarching framework for resiliency activities. Other planning efforts, policies, strategies, and projects should fit into this framework to be effective in the efforts to achieve the community's goals. Implementation of the SMP recommendations will likely be done by different project sponsors over many years. As time progresses and individual projects evolve, it is easy for their purpose, goals, deliverables, and timelines to change. The SMP and its future updates will provide the touchstone to ensure all activities implement Shaktoolik's vision and goals.

## 3. Communication

The SMP will document and communicate the community's vision, guiding principals, and strategic actions, and will be used by the community, government entities, and other people or groups that have an interest in Shaktoolik. It provides a centralized reference that shares the same information with all interested parties.



## 4. Relationship Building

It would be challenging for Shaktoolik to fully implement the SMP recommendations using solely its own resources. Building relationships with other organizations will help Shaktoolik realize its vision and goals. Potential partners will participate in the SMP development process, creating a foundation from which to

---

*Substantial investments in the infrastructure at the current community site will be necessary whether or not Shaktoolik eventually decides to relocate.*

---

SOURCE: Adaptation Plan (Norton Bay Inter-Tribal Watershed Council 2012)

build as activities progress.

## 4 Summary of Previous Projects<sup>3</sup>

This section provides an overview of previous projects that address the risks of flooding and erosion.

---

<sup>3</sup> The source for much of the information in this section is the Adaptation Plan (Alaska Sea Grant and Glenn Gray and Associates 2014).

## a. Immediate Action Workgroup

The Immediate Action Workgroup of the Governor’s Executive Sub-cabinet on Climate Change was established in 2008 to address known threats to communities caused by coastal erosion, thawing permafrost, flooding, and fires. The workgroup developed a series of policy recommendations to help develop a strategic approach for addressing climate change in Alaska. The policy recommendations included:

---

*“It is going to happen soon just hoping we’re ready.”*

*-- Community Survey*

---

- Establish a statewide system to document, assess, and analyze current and planned public infrastructure in order to protect existing and future investments and prevent threats to life in an uncertain environment.
- Sunset the Immediate Action Workgroup and direct the relevant State agencies to establish an interagency collaboration with each other, along with relevant federal agencies and communities. This collaborative approach requires regularly scheduled meetings to coordinate information, planning, evaluation, and decisions on public infrastructure for those communities impacted by climate change phenomena.
- Assistance to communities in peril must utilize comprehensive integrated planning and viable, future-oriented solutions with funding that allows for sustainability, regardless of whether the community remains in place, uses a migration strategy, or needs to relocate.
- The State of Alaska will lead a coordinating effort to develop a comprehensive statewide data collection and evaluation system that provides foundational information for community and business decisions, solutions leading to effective responses, and adaptation strategies to address climate change impacts.

---

*“We are doing something. I tell them, let’s make a start and maybe we’ll get some help.”*

*-- Mayor Asicksik*

---

## **b. Shaktoolik Flooding Analysis**

In 2011, the U.S. Army Corps of Engineers did a study of flooding risks to the community from Norton Sound and the Tagoomenik River. The study included collecting measurements of the offshore bathymetry, completion of beach profiles, development of a map referencing elevations to mean lower low water, and development of a model to predict flooding events. The model used historic wind, wave, and storm-surge water level data.

---

*While storms may not be getting stronger than in the past, the later freeze-up subjects the community to increased risks of flooding and erosion. Without the protective cover of ice, waves and storm surges from fall storms damage the community. Threats include a potential for both loss of property and human life.*

---

SOURCE: Adaptation Plan (Norton Bay Inter-Tribal Watershed Council 2012)

## **c. Hazard Mapping Project**

In 2011, the Alaska Division of Geological and Geophysical Surveys (DGGS) hazard mapping project performed field investigations to assess natural hazards facing Shaktoolik. The project collected extensive baseline data about local geology, coastal and ocean processes, and historic storms in and around the community. The DGGS team established beach profiles in front of the current community and the former site. The final product is a map depicting the natural hazards. The investigators returned to Shaktoolik after the November 2011 storm to investigate storm damage and to complete new beach profiles (Kinsman and DeRaps 2012).

## **d. Shaktoolik Planning Project**

Between 2010 and 2012, Glenn Gray and Associates, in association with Kawerak, Inc., and McKnight and Associates, worked with the community to complete the Shaktoolik Planning Project. The project involved an assessment of the risks of natural hazards to the community. It also involved a door-to-door survey of the residents, a Situation Assessment, and a final report that summarized recommendations by community leaders. Detailed information about the community and risks from natural hazards can be found in the Situation Assessment, as well as a vulnerability assessment.

## **e. Storm Surge Monitoring**

In June 2013, the Alaska Department of Transportation and Public Facilities (DOT&PF) installed a storm surge gauge in Shaktoolik as part of a grant to establish storm surge monitors in up to eight Western Alaska locations. Coastal engineers established the gauge and made arrangements for local monitoring; however, the gauge was washed away during a storm. It was not located and a replacement gauge was not installed.

## f. Vegetated Berm

The DOT&PF had designed a vegetated berm for the community as an experimental project. Shaktoolik adapted the design to remove the vegetation in order to allow the project to be built with available funds. The community of Shaktoolik then constructed a 1-mile coastal berm to help protect against fall storm surges. The berm cost approximately \$170,000 and was constructed in 2014.

## g. Adaptation Plan

Shaktoolik participated in an Alaska Sea Grant project, completed in 2014, to develop an Adaptation Plan (Alaska Sea Grant and Glenn Gray and Associates 2014). The plan outlined the next steps for Shaktoolik as it responds to threats from a changing climate and prepares for the SMP effort. During this process, the community decided on a “defend in place” approach, which would allow residents to remain at the current village site. The community also adopted nine initiatives to protect residents, buildings, and infrastructure. The initiatives were selected because they were considered cost-effective and encouraged the use of local resources. The initiatives were (Alaska Sea Grant and Glenn Gray and Associates 2014):

- 1. Vegetated Berm:** Construct a vegetated berm in front of the community.
- 2. Storm Surge Mound:** Construct a mound to serve as a place of refuge during a storm.
- 3. Multipurpose Building:** Construct a building for use as offices and a storm shelter.
- 4. Tank Farms:** Explore options to replace and relocate the community’s two tank farms.
- 5. Background Papers:** Develop brief issue papers and funding proposals for each initiative.
- 6. Hazard Plan:** Update the local hazard mitigation plan to reflect current priorities.
- 7. Monitoring:** Continue community and agency monitoring of storm surges and erosion.
- 8. Future Studies:** Pursue funding for new studies needed to implement the adaptation plan.
- 9. Guidelines:** Develop local guidelines for future development to protect structures from storms.

---

*“Shaktoolik berm project should be made high and line up with rebar and three foot thick with concrete”*

*-- Community Survey*

---

## h. Other Climate-Related Planning Efforts

A number of other planning efforts that relate to climate change impacts to Shaktoolik are summarized below.

- **Local Hazard Multi-Hazard Mitigation Plan:** This plan identifies local hazards facing the community (WHPacific 2009). The plan is to be updated every 5 years.
- **Emergency Plans:** Three plans completed in 2010 address community responses to emergencies, including storm-related events: *Emergency Operations Plan*, *Evacuation Plan*, and *Continuity of Operations Plan* (Ecology and Environment 2010a, 2010b, 2010c).
- **Multi-Purpose Building:** A 2012 feasibility study analyzed costs and options for a multi-purpose building that could also serve as an emergency shelter during a storm (USKH 2012).
- **Economic Development Plan:** Kawerak, Inc., the regional tribal organization, periodically updates the community's local economic development plan (Kawerak 2013). This plan identifies local priorities, including those related to threats of natural hazards. The most recent version of the plan was completed in 2013 and indicates the community's top-priority project is an evacuation road (Kawerak 2013). The evacuation road would allow community residents to access higher and safer ground during storm and flood events.
- **Norton Bay Climate Adaptation and Action Plan:** Although this plan mentions Shaktoolik, it focuses on the watershed around Elim, another community in Norton Sound (Norton Bay Inter-Tribal Watershed Council 2012). It includes seven goals, ranging from obtaining more data to increasing funding opportunities.

## 5 Summary of Environmental Considerations

The following summary identified known key important natural resources in Shaktoolik as documented in previous studies and reports.

### 5.1 Fish and Wildlife

#### 5.1.1 Birds and Waterfowl

According to the *Shaktoolik Evacuation Road Project Route Reconnaissance Report* (Kawerak 2008), the waters around the community are inhabited by numerous migratory birds. In early June, large numbers of bird species pass by the area when migrating either to their Arctic breeding grounds or to nest. Birds and waterfowl found in the area may include (ADF&G 1996, Kawerak 2013):

- American widgeon
- Arctic tern
- Auklet
- Black brant
- Black scoter
- Bristle-thighed curlew
- Bufflehead
- Cackling Canadian goose
- Canvasback
- Common eider
- Common loon
- Common merganser
- Cormorant
- Emperor goose
- Glaucous gull
- Godwit



- Golden plover
- Goldeneye
- Green-winged teal
- Guillemot
- Harlequin
- King eider
- Kittiwake
- Lesser Canadian goose
- Long-tailed duck
- Mallard
- Mew gull
- Murre
- Northern pintail
- Northern shoveler
- Pacific loon
- Puffin
- Red-breasted merganser
- Red-throated loon
- Sabine's gull
- Rock ptarmigan
- Sandhill crane
- Scaup
- Spectacled eider
- Spruce grouse
- Steller's eider
- Surf scoter
- Tundra swan
- Whimbrel
- Snow goose
- White-fronted goose
- White-winged scoter
- Wigeon
- Yellow-billed loon
- Willow ptarmigan

### 5.1.2 Terrestrial and Marine Mammals

Terrestrial and marine mammals that may be found in the Shaktoolik area include:

- Beaver
- Brown bear
- Caribou
- Lynx
- Marten
- Moose
- Arctic fox
- Musk ox
- Muskrat
- Otter
- Red fox
- Squirrel
- Rabbit
- Reindeer
- Whale
- Wolf
- Wolverine
- Bearded seal
- Beluga
- Bowhead whale
- Grey whale
- Minke whale
- Polar bear
- Porpoise
- Ribbon seal
- Ring seal
- Spotted seal
- Walrus

### 5.1.3 Threatened and Endangered Species

Species listed under the Endangered Species Act (ESA) that may occur in the terrestrial or marine environment near Shaktoolik are managed by either the U.S. Fish and Wildlife Service (USFWS) or the National Marine Fisheries Service (NMFS). The species managed by the USFWS include:

- Short-tailed albatross
- Polar bear
- Steller's eider
- Spectacled eider
- Pacific walrus (candidate for listing)

Short-tailed albatross are found in the Bering Sea, but they are typically far from shore and would not likely be affected. Spectacled eiders also have designated critical habitat in the waters surrounding Shaktoolik. The critical habitat was recognized for its importance to the species during molting (late June through August), and any future projects would need to ensure that the marine habitat for this species would not be adversely affected.



NMFS-managed species that may be found in the waters around Kivalina include:

- Steller sea lion - Western Distinct Population Segment (DPS)
- Bowhead whale
- Fin whale
- Humpback whale
- Sperm whale
- Bearded seal - Beringia DPS
- Ringed seal, Arctic subspecies

Pacific Walrus  
SOURCE: Joel Garlich-Miller, USFWS

Additionally, blue whales, North Pacific right whales, and grey whales are rare in the Bering Sea region.

#### 5.1.4 Fish

The Shaktoolik River and Tagoomenik Creek are listed as anadromous streams in the ADF&G Fish Distribution Database. Both support chum salmon, coho salmon, Chinook salmon, pink salmon, and Dolly Varden (ADF&G 2015). According to the *Shaktoolik Local Economic Development Plan* (Kawerak 2013), the waters around Shaktoolik also support:

- Sockeye salmon
- Blackfish
- Burbot
- Capelin
- Clams
- Cod
- Eel
- Flounder
- Grayling
- Halibut
- Herring
- King crab
- Northern pike
- Sculpin
- Sheefish
- Smelt
- Whitefish

## 5.2 Vegetation

Vegetation in the area is mostly tundra covered with willows and shrubs, and



marshy areas with lakes and ponds. Plants in the area include lichens and shrubs, mosses, grasses, and low berry bushes. There are timbered areas approximately 2 to 3 miles from the mouth of the Shaktoolik River that consist of stands of spruce groves and other deciduous trees.

### 5.3 Soils

According to the *Shaktoolik Evacuation Road Project Route Reconnaissance Report* (Kawerak 2008), the soils around Shaktoolik are poorly drained, with a peaty surface layer. The area has gray sand and gravel that extends below the organic mat to a depth of 10 feet. Below that is bedrock, which is estimated to extend to depths exceeding 100 feet. On the wave-formed barrier bar where the community is located, drainage is considered to be excellent. The warming effect of water bodies on both sides of the sand bar, combined with the underlying well-drained gravel, keeps the area virtually free of permafrost, although it is occasionally encountered.

### 5.4 Historical and Cultural Resources

There are 11 previously documented cultural resources within 1 mile of Shaktoolik. All sites remain unevaluated for the National Register of Historic Places. Six sites with historic era components are documented in the area. Historic era sites include the Shaktoolik Roadhouse, an historic cemetery, building ruins, a cribbed well, and other historic remains that currently lack descriptive information. Five sites contain prehistoric remains, such as cache pits, and semi-subterranean house depressions.

## 6 Identification of Issues

This section describes known issues faced by the community of Shaktoolik that will have to be addressed during the development of the SMP.

### 6.1 Lack of Capital Funds

Shaktoolik, like many other communities, does not have the financial capital it needs to fully implement its adaptation strategy. Even by partnering with other agencies, it is unlikely that Shaktoolik will be able to obtain all the necessary capital funds. The SMP will need to identify creative and innovative ways to achieve Shaktoolik's vision while keeping capital expenditures to affordable levels.

### 6.2 Lack of Community Infrastructure

Much of the community's infrastructure is in poor condition. One reason for this is that agencies have been reluctant to make infrastructure improvements out of concern that the investment will be lost due to climate-change-related erosion and flooding. However, it could be years or decades before a relocation effort is complete. Also, the community recently decided to focus on defending in place (see Section 6.5), which means relocation may not happen or may not occur for a long period of time.

The most critical infrastructure Shaktoolik is lacking relates to sanitation (water, sewage, and landfill). The water tank is rusting and wearing out, and the tank roof needs to be insulated to prevent the stored water from freezing.

The location of the landfill is also an issue. There is concern that erosion in the area could result in the landfill harming the water source. The landfill is also too close to the airport to meet Federal Aviation Administration regulations. The community is in the process of relocating the landfill.

In particular, the existing tank farms and sewer lines are a local concern, as they are vulnerable to erosion. Additionally, the fuel tanks do not meet U.S. Coast Guard standards, and several tanks are not usable because of deterioration caused by rust.



The community needs infrastructure that supports its immediate and long-term needs at the existing site.

### 6.3 Community Morale

The continuing threat of erosion, storm surge, thawing permafrost, and other natural hazards has serious implications for the mental health of the community. Residents have been frustrated by having to deal with these issues for years without seeing much tangible progress. Recent activity such as the construction of the berm has been a positive step forward, and residents want that progress to continue.

---

*“Our land we live on is getting narrower, our floods and severe storms are getting more and more dangerous to live on this narrow stretch of land with nowhere to run away to if it gets really bad.”*

*-- Community Survey*

---

### 6.4 Lack of Housing/Overcrowding

Shaktoolik does not have enough housing to meet its needs. Overcrowding is quite common in the community. Many housing units contain multi-generational extended families. The scale of overcrowding is not clearly defined, as not all households apply for assistance or file the related paperwork for assistance renewal. Other barriers to housing assistance and construction include inadequate employment and ineligibility for housing assistance.

Much of the community's existing housing is in need of repair. Many units have issues related to flooring, electrical wiring, water, sewer, and mold. There is also little or no room for expansion to meet the needs of the growing population.

### 6.5 Long-term Objective

The community has decided upon a "defend in place" approach, which allows the community to remain at its existing site. There are many reasons for that decision, including the fact that many residents like the existing site and it could take decades before the resources needed for relocation are available. While defending in place will help the community in the near future, residents have indicated that in the long term, relocation may have to be considered and planned for. One concern the community expressed



---

*"Relocation is the only option we should consider right now."*

*-- Community Survey*

---

about considering relocation was the disinvestment experienced by other communities after they made the decision to relocate and the potential for that to occur in Shaktoolik.

### 6.6 Lack of Refuge

One of the biggest concerns in Shaktoolik is having a safe place to be during storms. The highest point in Shaktoolik is approximately 22.3 feet and 50-year coastal flooding events are anticipated to inundate the community with approximately 1-3 feet of water (USACE 2011). The closest area of higher ground is approximately 2-3 miles away from the community. Previously, an evacuation road was considered but was ultimately deemed impractical and expensive. The route that was considered would have been on the spit, but that area would be flooded by any storm that flooded the community. In addition, the community does not have



enough vehicles to transport all the residents, nor would there be any shelter at the terminus of the road. The cost estimate for the road was \$12-60 million.

The community received funding to expand and reinforce the school as a storm shelter, but the school is not high enough or large enough to protect all the residents.

---

*Currently there are no facilities in the community that can offer safe shelter or high ground that can accommodate the population of the entire village that would likely remain in the community or await evacuation should an emergency occur.*

---

SOURCE: Final Report: Shaktoolik Community Emergency Shelter (USKH 2012)

## 6.7 Other

Other issues raised by community residents include:

- Need VPSO
- Alcohol- and drug-free community
- More prevention programs
- More employment opportunities
- Residents need to be prepared and have emergency kits

---

*“more jobs for those who need work to provide for their families”*  
-- Community Survey

---

## 7 Values, Vision Statement, and Guiding Principles

### 7.1 Community Values

Community values reveal what is important to the community. Together with the guiding principals, goals, and objectives, community values provide the basis for decision making. Community values were identified both through value surveys completed by residents in April and May 2015 and in an exercise that took place during a May 2015 community meeting.



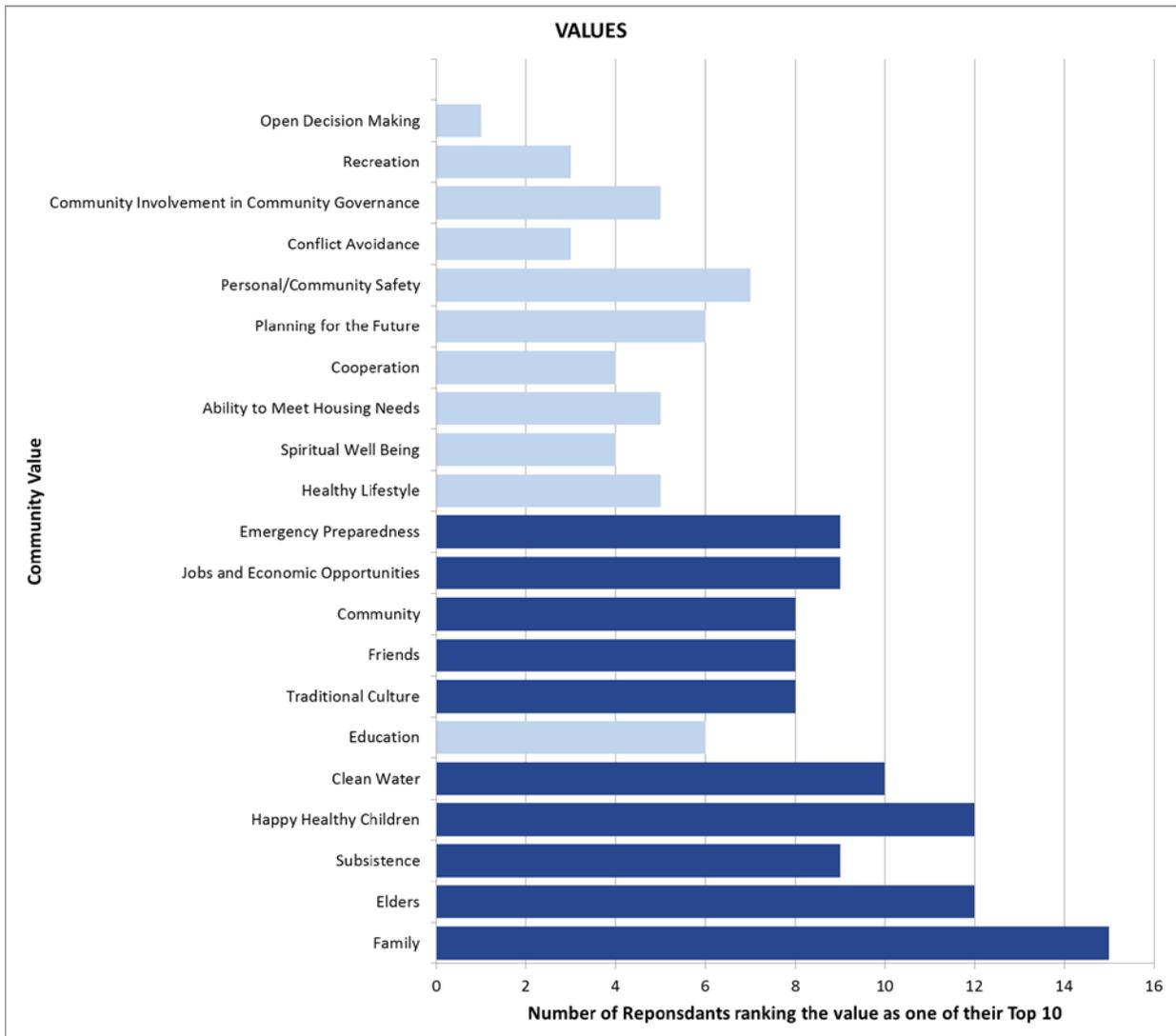
This section summarizes the input received from the survey and during the community gathering in regard to values. Both exercises listed values based on background information, but people were allowed to add their own values to the list.

The survey administered in April and May allowed people to designate their top 10 values. As of May 7, 2105, the survey was completed by 16 residents. The top 10 values (in order) identified by residents were:

1. Family
2. Elders
3. Happy, healthy children
4. Clean water
5. Subsistence
  - Jobs and economic development
  - Emergency preparedness
8. Traditional culture
  - Friends
  - Community

Figure 5 shows how the survey values were ranked.

Figure 5. Community Values



At the community gathering, people were asked to indicate their top values. The top values identified during the meeting were subsistence, emergency preparedness, family, and clean water.

For additional information about how the community values were identified and prioritized, please see Appendix A.

## 7.2 Vision Statement

The mission of the *Shaktoolik Strategic Management Plan* is to create a safe and sustainable community for existing and future residents.

However, understanding the high cost and complicated logistics and availability of funding for village relocations, the residents of Shaktoolik have decided to focus on shorter-term and less-costly solutions, such as building a community emergency shelter that is easily accessible to community residents.



The vision statement for the SMP has been developed based on the community’s Adaptation Plan, the results of the community’s April 2015 vision survey, and community input during the May 2015 community meeting. The result of that process is the following SMP vision statement:

Shaktoolik is a safe and resilient community. We want to stay and defend our community from erosion and reduce our risk from hazards. We will work together and with partners to develop projects and policies to protect our residents, infrastructure, natural environment, and subsistence resources. We will increase resiliency while respecting our traditional values. We will preserve and enhance our community for us and future generations.

---

*“Vision – to let children & grandkids to get an education; respect each others;”*

*-- Community Survey*

---

### 7.3 Guiding Principles

Guiding principles provide the overall direction for the Shaktoolik SMP. The guiding principles, combined with the Vision Statement, should be a foundation for the SMP and provide a context for decision making so that limited capital resources can be maximized. As part of their Adaptation Plan, the community of Shaktoolik developed a set of guiding principles for climate change adaptation. Based on information from a literature review and community input, additional guiding principles were developed. These principles will be used by the community and agencies in helping Shaktoolik achieve its goals, as well as to evaluate potential actions. If actions are not consistent with the guiding principles, they should not be undertaken. It is the hope and intent of the planning team that residents and partners working to make Shaktoolik more resilient will respect and promote these principles.

---

*“Shaktoolik should be a safe and healthy environment. I would like to see young adults making a better change. I believe that we should have gatherings, not just for special occasions but to spend time together as a community.*

*Children should be able to go somewhere in the summer. I think we need a basketball court and a playground. Also, more jobs would be great! Some adults have no jobs to support their family, but all jobs (most) are full. ”*

*-- Elder Interview*

---

The Adaptation Plan’s guiding principles are:

- The most important concern is to protect lives during a catastrophic flood event.
- Low-cost approaches that involve local resources and labor will be given priority.
- Opportunities to partner with agencies and organizations will be encouraged.
- A reasonable likelihood exists that the measure can be funded.
- Monitoring impacts from future storms, including flood levels and erosion, will provide important information for future planning efforts.

Additional guiding principles are:

- Residents must be safe from natural hazards and growing threats of flooding and erosion.
- Continue to be proactive as a community.
- Include local input into the process.
- Protect the natural environment.
- Continue the collaboration between the City Council, IRA Council, and Corporation Board.
- Respect our traditional culture.
- Use funds wisely.
- Develop in a manner that strengthens the community.

---

*“Continue subsistence lifestyle; be secure & have a safe place to live; road development to get to a safe place when there is a storm or natural event”*

*-- Elder Interview*

---

## **8 Next Steps**

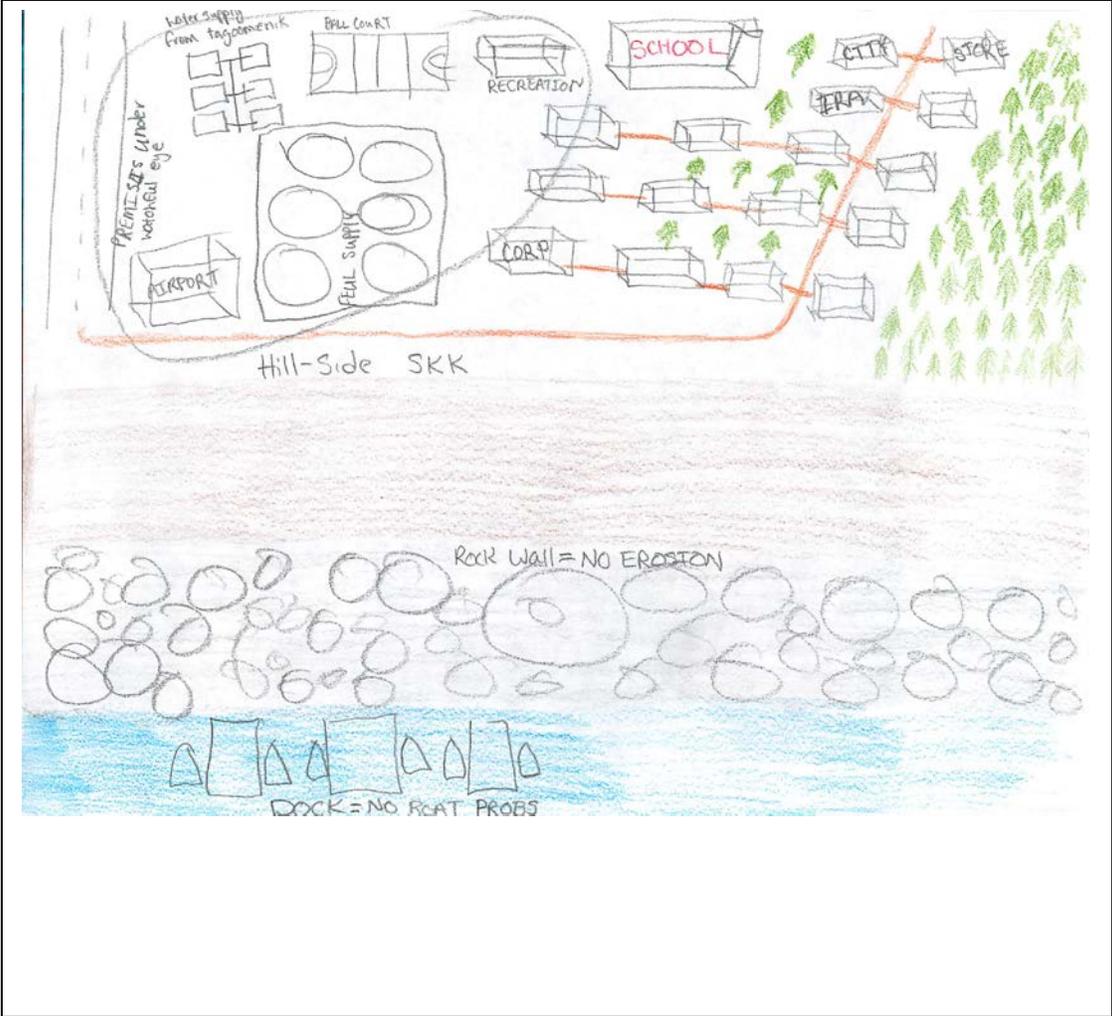
Based on the information presented in this *Background Planning Report*, the next step is to work with the community to develop an SMP designed to address the issues presented here. The SMP will focus on responses to climate-change-related impacts and will provide a blueprint for how the community and agencies will proceed over the next 5 to 20 years to make Shaktoolik more resilient in the short- and long-term.

---

*“When I am an elder I want Shaktoolik to be a spectacular. I want Shaktoolik to have a new store. I want Shaktoolik to have a Job Corps that have better paying jobs that can pay more money.”*

*-- Classroom exercise*

---



---

*"How much more can our community take."*

*-- Community Survey*

---

## h. References

- ADF&G (Alaska Department of Fish and Game). 1996. Subsistence Use of Birds in the Bering Strait Region, Alaska. Division of Subsistence, Technical Paper No. 239.
- ADF&G. 2015. Fish Resource Monitor.  
<http://extra.sf.adfg.state.ak.us/FishResourceMonitor/?mode=awc>.
- Alaska Sea Grant and Glenn Gray and Associates. 2014. Shaktoolik, Alaska: Climate Change Adaptation for an At-Risk Community. Prepared for the Community of Shaktoolik, February 27, 2014.
- DCCED (Department of Commerce, Community, and Economic Development). 2012. Increasing Community Resilience by Integrating Hazard Mitigation into Local Comprehensive Planning Efforts. 2012 Alaska Planning Conference, Anchorage, Alaska, November 13, 2012.  
[http://www.commerce.state.ak.us/dnn/Portals/4/pub/AK\\_APA\\_Haz-Mit\\_Comp-Plan.pdf](http://www.commerce.state.ak.us/dnn/Portals/4/pub/AK_APA_Haz-Mit_Comp-Plan.pdf)
- Ecology and Environment, Inc. 2010a. Emergency operations plan: Shaktoolik, Alaska. Prepared for the City of Shaktoolik and the Native Village of Shaktoolik IRA Council and the Alaska Department of Military and Veterans Affairs, Division of Homeland Security and Emergency Management. January 2010.
- Ecology and Environment, Inc. 2010b. Evacuation Plan: Shaktoolik, Alaska. Prepared for the City of Shaktoolik and the Native Village of Shaktoolik IRA Council and the Alaska Department of Military and Veterans Affairs, Division of Homeland Security and Emergency Management. February 2010.
- Ecology and Environment, Inc. 2010c. Continuity of operations plan: Shaktoolik, Alaska. Prepared for the City of Shaktoolik and the Native Village of Shaktoolik IRA Council and the Alaska Department of Military and Veterans Affairs, Division of Homeland Security and Emergency Management. February 2010.
- GAO (Government Accountability Office). 2003. Alaska Native villages: Most are affected by flooding and erosion, but few qualify for federal assistance. General Accounting Office. Report to Congressional committees.
- GAO. 2009. Alaska Native villages: Limited progress has been made on relocating villages threatened by flooding and erosion. U.S. Government Accountability Office Report to Congressional Requestors. GAO-09-551. June 2009.
- Gray (Glenn Gray and Associates), Kawerak, Inc., and McKnight and Associates. 2012. Shaktoolik Planning Project: Final Situation Assessment. Prepared for the Community of Shaktoolik.
- Kawerak (Kawerak, Inc.). 2008. Shaktoolik Evacuation Road Project: Route Reconnaissance Report. Prepared for the Native Village of Shaktoolik, December 2008.

- Kawerak. 2013. Shaktoolik Local Economic Development Plan 2013-2018. Prepared for the Community of Shaktoolik and the Bering Strait Development Council.
- Kinsman, N., and M. DeRaps. 2012. Coastal hazard field investigations in response to the November 2011 Bering Sea storm, Norton Sound, Alaska. Report of Investigations 2012-2. Division of Geological and Geophysical Surveys, Alaska Department of Natural Resources.
- Norton Bay Inter-Tribal Watershed Council. 2012. Climate adaptation and action plan for the Norton Bay watershed, Alaska.
- Sea Grant Alaska. 2012. Shaktoolik, Alaska: Climate Change Adaptation for an At-Risk Community – Fact Sheet.  
[http://itepsrv1.itep.nau.edu/itep\\_course\\_downloads/ClimateAdaptation\\_Resources/ExamplePlansReports/Alaska/Shaktoolik\\_Fact\\_Sheet.pdf](http://itepsrv1.itep.nau.edu/itep_course_downloads/ClimateAdaptation_Resources/ExamplePlansReports/Alaska/Shaktoolik_Fact_Sheet.pdf)
- USACE (U.S. Army Corps of Engineers). 2011. Shaktoolik Coastal Flooding Analysis. October 2011.  
[http://commerce.state.ak.us/dnn/Portals/4/pub/2011\\_USACE-Coastal\\_Flooding\\_Analysis\\_Oct\\_2011.pdf](http://commerce.state.ak.us/dnn/Portals/4/pub/2011_USACE-Coastal_Flooding_Analysis_Oct_2011.pdf)
- USKH. 2012. Final report: Shaktoolik community emergency shelter. Prepared for the Native Village of Shaktoolik.
- U.S. Census Bureau. 2010. United States Census 2010. <http://www.census.gov/2010census/data/>
- U.S. Census Bureau. 2013. Selected Economic Characteristics: Shaktoolik, Alaska. American Fact Finder: 2009-2013 American Community Survey 5-Year Estimates.  
[http://factfinder.census.gov/faces/nav/jsf/pages/community\\_facts.xhtml](http://factfinder.census.gov/faces/nav/jsf/pages/community_facts.xhtml)
- WHPacific. 2009. Community of Shaktoolik, Alaska local multi-hazard mitigation plan. Prepared by Native Village and City of Shaktoolik, WHPacific and Bechtol Planning and Development.