



U.S. Army Corps  
of Engineers  
Alaska District

## ***ALASKA BASELINE EROSION ASSESSMENT***

### **AVETA Report Summary - Unalakleet, Alaska**

#### **Community Information**

Unalakleet is on Norton Sound at the mouth of the Unalakleet River, 148 miles southeast of Nome and 395 miles northwest of Anchorage. The community is at approximately 63° North Latitude and -160° (West) Longitude, (Sec. 03, T019S, R011W, Kateel River Meridian). Unalakleet is in the Cape Nome Recording District. The area encompasses 2.9 square miles of land and 2.3 square miles of water. Unalakleet has a subarctic climate with considerable maritime influences when Norton Sound is ice-free, usually from May to October. Winters are cold and dry. Average summer temperatures range from 47 to 62 degrees Fahrenheit; winter temperatures average -4 to 11 degrees Fahrenheit. Extremes have been measured from -50 to 87 degrees Fahrenheit. Precipitation averages 14 inches annually, with 41 inches of snow.



The Unalakleet shoreline.



Typical rock filled gabion bank protection

#### **What are the costs associated with continued erosion?**

Three elements associated with erosion costs are: past protection endeavors, the cost of ongoing repair and maintenance, and future damages. These are discussed in more detail in the following paragraphs.

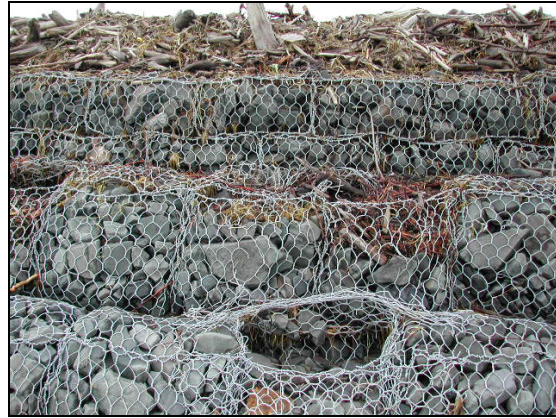
#### **Historical Erosion Protection Costs**

In 2000 the Natural Resource Conservation Service (NRCS) constructed 1,400 feet of gabions (wire baskets filled with rock) beginning at the upstream end of the fish processing plant on the Unalakleet River and extending around the end of the spit approximately 1,000 feet with a cost of about \$1.3 million. A late November storm in 2003 caused severe damage to the gabions. The State of Alaska signed a disaster declaration for this area and the community is applying for funding to repair the gabions. The estimated remaining life of the gabions ranges between

2 and 10 years. Failure would cause site specific damage to structures and facilities, but complete loss of the community is not expected.



Sagging Gabion Wall



Typical Gabion Cell Rupture

Erosion control efforts by the state from 1983 to 2004 totaled almost \$2 million.

#### **Cost of New Shoreline Protection**

The existing bank protection at Unalakleet is in need of major repair or replacement. The gabion structure has been ruptured in places, spilling the rock core out where it can easily be washed away even during good weather conditions. The Corps is developing a project to remedy the erosion in this location through the construction of a riprap revetment with an estimated cost of about \$20,000,000.

#### **Future Damages**

##### ***Residential Structures Assumptions***

Some housing is expected to be lost if the bank protection is not repaired or replaced. These losses would be limited in nature to areas directly adjacent to gabion wall failure.

##### ***Commercial and Public Buildings Assumptions***

The Unalakleet Fisheries processing plant is subject to erosion loss within the 50-year planning horizon. Due to the specialized nature of fish processing and the generally large pieces of equipment, it is assumed that moving the building and equipment out of harm's way is not an option.

##### ***Infrastructure Assumptions***

Various site specific roads, electric and telephone lines, and water and sewer lines in the community are subject to loss, though the infrastructure as a whole is not expected to be destroyed.



### **Summary of Future Damages**

The combined residential, commercial and public buildings, and infrastructure costs due to erosion are more than \$105 million for the 50-year project horizon if the existing protection is not repaired or no further erosion protection is installed.

### **What are potential costs associated with moving to a new location or an existing community?**

There is no reasonable need for Unalakleet to relocate. With the exception of a few small segments, the erosion at Unalakleet has been contained. The rest of the erosion is currently being addressed through other means. In addition, the community and state have not expressed interest in relocating Unalakleet; therefore, costs for relocation were not developed.

### **What is the expected time line for a complete failure of the usable land?**

Catastrophic failure of the sand spit is not expected; however, the community will continue to suffer property damage and loss from erosion. Unalakleet suffers from erosion on both the ocean side (Norton Sound) and from the Unalakleet River. The erosion rate on the Norton Sound side averages 1 foot per year and occurs when storm surge attacks the spit, washing away beach material. The rate of erosion from the Unalakleet River is more severe and averages 2 feet per year.

At current erosion rates the fish processing plant and some residences at the mouth of the Unalakleet River could be lost within 2 to 10 years. The community's water line running along Norton Sound could also be lost, as well as some parts of the airport. Over time, erosion will continue to capture some residences, roads, and utilities but the community as a whole will not be destroyed.



