



U.S. Army Corps  
of Engineers  
Alaska District

## **ALASKA BASELINE EROSION ASSESSMENT**

### **AVETA Report Summary – Newtok, Alaska**

Newtok is on the Ninglick River north of Nelson Island in the Yukon-Kuskokwim Delta Region. It is 94 miles northwest of Bethel. The community is at approximately 60° North Latitude and -164° (West) Longitude (Sec. 24, T010N, R087W, Seward Meridian). Newtok is in the Bethel Recording District. The area encompasses 1.0 square mile of land and 0.1 square mile of water. Newtok has a marine climate. Average precipitation is 17 inches, with annual snowfall of 22 inches. Summer temperatures range from 42 to 59 degrees Fahrenheit; winter temperatures are 2 to 19 degrees Fahrenheit.



Typical Newtok Erosion



The Village of Newtok

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

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

#### **Erosion Protection Costs**

The Ninglick River has been eroding and moving in the direction of Newtok for decades. There are no geologic or channel geometry limitations evident that will slow down or stop the erosion before it reaches Newtok. Erosion control efforts by the state from 1983 to 1989 totaled almost \$1.5 million.

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

To protect Newtok from further erosion would require a 5,280-foot-long erosion revetment. Construction costs are estimated at \$90 million.

### **Future Damages**

The approach used to determine potential erosion damages at Newtok is based on several assumptions as they pertain to the damage categories of residential, commercial, public infrastructure, and land values. In addition, damages are based on an assumed rate of erosion. These damages are those that would occur should the erosion protection not be installed or the community not relocate.

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

Some residential structures are expected to be lost in about 10 to 15 years with major loss in about 20 years. It is assumed that as erosion approaches individual homes, homeowners will take steps to salvage their personal property.

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

Public buildings in Newtok include a health clinic, school, armory, church, the Traditional Council Office, Post Office, and Community Hall. Some of these may be able to move to a different location in town before being lost to erosion, but the majority of these would be reached by the erosion in 10 to 15 years.

### ***Infrastructure Assumptions***

Estimates were made concerning the boardwalks, electric lines, and water pipeline that would be lost as a result of erosion in the years prior to the lost over the next twenty years. Public utilities are considered a total loss in about twenty to twenty five years.

### **Summary of Future Damages**

The combined residential, commercial, and public buildings and infrastructure costs due to erosion at Newtok are estimated to be more than \$119 million for the 50-year project horizon.

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

In 1994, the Newtok Traditional Council started a relocation planning process in response to the erosion problem. The Council analyzed six potential village relocation sites, and a community vote in August 2003 overwhelmingly selected a site on the north end of Nelson Island, approximately 9 miles southeast of Newtok. This site is known locally as Takikchak. In January 2004 the Newtok Traditional Council provided a report prepared by the engineering firm ASCG, Inc, which documented the Council's relocation planning process and site selection. This report included a geotechnical overview of the Takikchak site conducted by the Corps under the Planning Assistance to States (PAS) program.

Congress approved a land exchange between the Newtok Village Corporation and the U.S. Fish and Wildlife Service in 2003, under the Alaskan Native Village and the Interior Department Land Exchange Act of November 17, 2003, Public Law 108-129, 117 Stat. 1358. The Department of Interior conveyed 10,943 acres at the Takikchak site to the Newtok Village Corporation on April 28, 2004.

The community is actively working to establish a seed community in this new location by getting a few new Department of Housing and Urban Development (HUD) houses constructed at the new site.

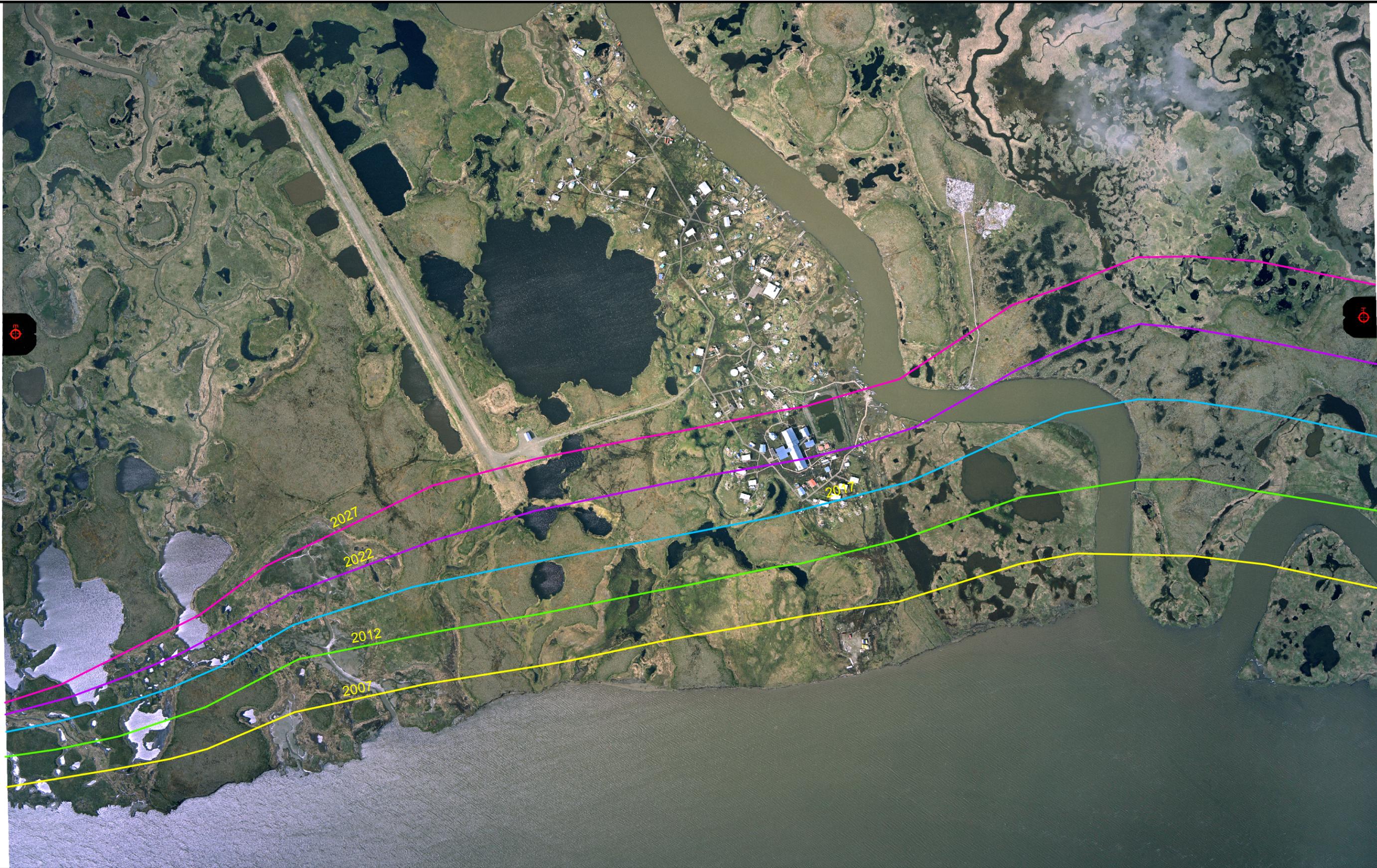
To relocate Newtok “as-is” to the Nelson Island site would cost an estimated \$125 million.

To collocate Newtok “as-is” with one of the nearby Nelson Island communities would cost an estimated \$76 million.

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

According to work done by Woodward-Clyde Consultants, the erosion appears to be caused mainly by wave action and thermal degradation of the ice rich riverbank. The average long-term erosion rate in the Newtok area from 1957 to 2003 was estimated to be 71 feet per year. The minimum erosion rate for this period, which occurred from 1974 to 1977 and from 1999 to 2003, was 42 feet per year. The maximum erosion rate for this period, which occurred between 1977 and 1983, was 113 feet per year.

Based upon the erosion rates and the location of major utilities and infrastructure, the community will be a complete loss in 10 to 15 years.



Alaska District  
Corps of Engineers  
Civil Works Branch

Predicted and Historical Shorelines

- 2007
- 2017
- 2027
- 2012
- 2022



Image dated June 2004



Alaska Village Erosion  
Technical Assistance Program  
**Newtok, Alaska**