



U.S. Army Corps  
of Engineers  
Alaska District

## **ALASKA BASELINE EROSION ASSESSMENT**

# **Erosion Information Paper – Nelson Lagoon, Alaska**

Current as of September 24, 2007

### **Community Information**

Nelson Lagoon, population 63, is on the northern coast of the Alaska Peninsula, on a narrow sand spit that separates the lagoon from the Bering Sea. It is 580 miles southwest of Anchorage. The community is unincorporated and in the Aleutians East Borough (AEB). The coastal shoreline in Nelson Lagoon is used primarily for fishing.

### **Description of Erosion Problem**

The erosion problems in Nelson Lagoon include coastline erosion on the Bering Sea and Nelson Lagoon side of the spit, and river erosion from the Nelson and Sapsuk Rivers. The community survey indicates that factors causing and contributing to the erosion include high tides, storm surges, and wind and wave action. The community development director reported that much of Nelson Lagoon was protected by ice for part of the winter storm season, but during the past 10 to 15 years, this protection has not been present.

The beach area historically tends to wash out in one area and then rebuild in another. The active erosion area along the Nelson Lagoon side of the spit is less than 100 feet from community structures, including housing and the airstrip. This area is of highest priority and greatest concern to the community. In this area during winter of 1998, a storm event resulted in the exposure of 3,000 feet of the community's water line, which then froze. Major erosion events in the community have been constant for the last 20 years, resulting in an average of 5 feet per year of shoreline erosion. Erosion along the spit occurs at a rate of 1 to 2 feet per year, per the Community Survey, however no specific measurements of extent were provided.

### **Potential Damages**

The spit is getting longer and narrower as erosion advances on both sides. Based on the community survey, a number of residences, as well as the airport runway and associated facilities are at risk from erosion, with structures less than 100 feet away from advancing erosion areas. Additionally, erosion poses a threat to the 10.5 mile long water transmission line, which has required major repairs as part of an overall water system upgrade project. The community development director reported that community water lines have been replaced 3 times in past years due to erosion and storm damage (costs were not reported). The water line is now buried and the community has planted beach grasses over it in an effort to help protect against erosion damage.

In recent years the community has installed the following major erosion protection measures along the beach: (a) placement of gabions to anchor existing wood in the breakwater; and (b) placement of geotube containment structures, consisting of sediment-filled sleeves of geotextile fabric. The completed structure includes about 300 linear feet of geotube that is 5 feet high, with a 7½-foot attached scour apron on the seaward side to prevent toe scour.

The gabions project is reported to have cost about \$60,000. It is further reported that the measure has had little success due to high winds and tides. This project appears to correspond to *Alaska Legislative Appropriations for Flood and Erosion Control* summary collected by the Division of Community Advocacy showing Nelson Lagoon received funding for erosion control including dock protection totaling \$80,000 (1986-1989).

The geotube placement was a demonstration project funded by a \$100,000 Coastal Impact Assistance Program grant to the AEB. The project, completed in September 2005 has been in place for too short a time period for the community to assess its effectiveness.

According to the Borough community development director, an effective long-term erosion control program will be necessary in the future to ensure the safety of the water system and other community infrastructure.

## Photos and Diagrams

The attached photos of the erosion were provided by the AEB. Also, attached is a diagram depicting the linear extent of erosion in the community.

## References

**DCCED, DCA. 1994.** *Alaska Legislative Appropriations for Flood and Erosion Control, 1972-1991*, collected by Floodplain Management Program intern.

**Stadium Group. 2001.** *Strategic Economic and Community Development Plan*, Prepared for Nelson Lagoon.

**University of Alaska. 1978.** *Nelson Lagoon*.

**USACE. 1999.** *Trip Report, Nelson Lagoon*. Alaska District, U.S. Army Corps of Engineers.

**USACE. 2007.** *Alaska Community Erosion Survey, OMB approved number 07100001*, expires September 30, 2009 submitted by facsimile from Justine Gunderson, Nelson Lagoon Village Administrator on August 27, 2007, with additional information provided by Sharon Boyette, director of community development, Aleutians East Borough on September 19, 2007.

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## Additional Information

This information paper, as well as those for other communities, can be accessed on the internet at [www.alaskaerosion.com](http://www.alaskaerosion.com). For more information please contact the Corps of Engineers, project manager at (907) 753-5694 or email [Alaska.Erosion.POA@usace.army.mil](mailto:Alaska.Erosion.POA@usace.army.mil)



**Photo 1: Demonstration Erosion Control Project; installation of geotubes, September 2005.**



**Photo 2: Community members preparing to install geotube near dock, September 2005.**



BRISTOL BAY

GeoTube Demonstration Project  
Area completed 30 September 2005

Storm Flooding cuts off road

Highest priority area of erosion concern

10.5 mile long water transmission line is  
2nd highest priority erosion concern;  
extends off of photo

Egg Island

NELSON LAGOON

Date of Aerial Photo: 27 May 97

**NOTE:** The extent of erosion shown on this figure is based on interviews with the community. This data has not been field verified. This figure is only intended to show areas of erosion, not rates or severity of erosion



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----- Linear Extent of Erosion



Alaska Baseline Erosion  
Nelson Lagoon, Alaska