



U.S. Army Corps
of Engineers
Alaska District

ALASKA BASELINE EROSION ASSESSMENT

AVETA Report Summary– Bethel, Alaska

Community Information

Bethel is located along the Kuskokwim River, 40 miles inland from the Bering Sea. It is in the Yukon Delta National Wildlife Refuge, 400 air miles west of Anchorage. The community is at approximately 60° North Latitude and -161° (West) Longitude (Sec. 09, T008N, R071W, Seward Meridian.) Bethel is in the Bethel Recording District. The area encompasses 43.8 square miles of land and 5.1 square miles of water. Precipitation averages 16 inches a year in this area and snowfall averages 50 inches per year. Summer temperatures range from 42 to 62 degrees Fahrenheit. Winter temperatures range from -2 to 19 degrees Fahrenheit.



Beach landing at Bethel



Example of Bethel shoreline

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

Bethel is approximately 65 miles upriver from the mouth of the Kuskokwim River and is at the upriver limit of tidal influence from the Bering Sea. Bethel is the major educational, economic, social, and cultural community in the Southwest Alaska Region, serving numerous smaller villages along the Yukon-Kuskokwim River Delta. For the last 40 years the riverbank adjacent to the community has been seriously eroded.

Bethel experiences periodic flooding, mostly because of ice jams during the spring breakup of the Kuskokwim River. The spring ice breakup in 1995 caused such severe erosion that the governor of Alaska declared a state of emergency—scour created a cove

350 feet long and 200 feet inland and endangered several structures. The village's main port is the only one on the western Alaska coast for oceangoing ships and serves as the supply center for villages in the Yukon-Kuskokwim Delta. In response to the 1995 emergency, the Corps placed rock along 600 linear feet of the riverbank and dock.



Riverbank Protection at Bethel



Looking other direction

This was the beginning of a Corps 8,000-foot bank stabilization seawall project that cost \$24 million and was completed in 1997. This project included stabilization of the riverbank from the existing petroleum dock at the downstream end to the Bethel city dock at the upstream end.

Although Bethel is not in imminent danger, it has experienced serious erosion and has undertaken various infrastructure-specific activities to resolve this problem. The Corps has a project underway to repair the seawall by placing more rock, by replacing a steel tieback system, and placing steel wale on the inland side of the pipe piles. The project will reinforce the seawall 1,200 feet so that it protects the entrance to Bethel's small boat harbor. The initial cost estimate for this project in 2001 was over \$4.7 million. The project should be completed in 2006. Because of these measures, there are no plans for Bethel to relocate or collocate to another site.



Pile wall of current concern at Bethel.



Obvious outward bowing of wall.

Erosion control efforts by the State of Alaska legislative grants and Department of Transportation and Planning Formulation (DOT&PF) funds, Corps, and Federal Aviation Association (FAA) to date total more than \$57 million.

Future Damages

It is expected that future erosion damages are expected to be minimal because of the existing bank stabilization seawall and the proposed erosion protection project at the east and west bank of the harbor.

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

There is no reasonable need for Bethel to relocate. With the exception of a few small segments, the erosion at Bethel 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 Bethel; therefore, numbers for relocation were not developed.

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

With proper maintenance, the existing and planned projects should provide adequate erosion protection well into the future. No time line is provided because complete failure of the usable land is highly unlikely in the short or long term.



	<p>Alaska District Corps of Engineers Civil Works Branch</p>	<p>Historical and Predicted Shorelines</p> <table border="0"> <tr> <td> 1977</td> <td> 2005</td> </tr> <tr> <td> 2003</td> <td> 2020</td> </tr> </table>	1977	2005	2003	2020		<p>Image dated June 2003</p>	<p>Alaska Village Erosion Technical Assistance Program</p> <p>Bethel, Alaska</p>	
1977	2005									
2003	2020									