



**U.S. Army Corps
of Engineers**
Alaska District

ALASKA BASELINE EROSION ASSESSMENT

Erosion Information Paper - Kenai, Alaska

Current as of September 14, 2007

Community Information

Kenai (KEY-nigh); population 6,864, is on the western coast of the Kenai Peninsula, fronting Cook Inlet. Kenai is a Home Rule City in the Kenai Peninsula Borough. It is on the western boundary of the Kenai National Wildlife Refuge on the Kenai Spur Highway. The City of Kenai is approximately 65 air miles and 155 highway miles southwest of Anchorage.

Description of Erosion Problem

Based on information provided in the community survey, the Kenai River bluff fronting the city has a history of erosion problems, and over the past 20 years sections of the bluff face have receded at an estimated average rate of 3 feet per year. The bluff in the affected area consists of two distinct layers, with an upper layer of alluvial deposits overlying a layer of glacial till. Causes and factors contributing to the erosion of the bluff face includes groundwater seepage, overland flow, frost action, river currents, and wave action of Cook Inlet especially, with the high spring tides. Eroded material that accumulates at the toe of the bluff is carried away by river and tidal currents and wave forces. The linear extent of erosion in the city is approximately 5,000 feet, with a vertical bank height of approximately 70 feet.

Based on an analysis of aerial photographs dating to 1950, the erosion has apparently been fairly consistent over the past 50 years, with the most pronounced recession closest to the river mouth. The survey indicates areas of up to 20 feet laterally were significantly eroded following the 1964 Good Friday Earthquake. The shoreline of the dunes area south of the eroding bluff also has eroded, but erosion rates have not been estimated. The affected bluff area is within a Federal Emergency Management Agency (FEMA) Zone V3 (coastal high hazard area associated with storm-induced waves) according to the 1981 Flood Insurance Rate Map.

Potential Damages

Approximately five residential structures are within 10 feet of the bluff edge. These structures are at risk of collapse in the near future and will have to be abandoned or moved in the next few years, if the historical rate of bluff retreat continues. The historical erosion rate in the next 50 years would affect approximately 20 to 30 residential and commercial buildings. The community survey indicates that outbuildings, water and sewer lines, road, utility poles/lines, and sites of significant cultural and archeological value also are at risk. The area of public property at most risk from the bluff erosion is the city-owned Kenai Senior Center. A 1997 Corps report estimated that the Senior Center is about 125 feet from the top of the eroding bluff. At least 50 feet of land seaward of the building is considered necessary to safely support its foundation.

The city has limited access to the dunes to reduce dune erosion and vegetation loss along the shoreline. These efforts have met with some success, however no large-scale protective measures to control shoreline or bluff erosion have been undertaken to date. Individual property owners along the bluff have attempted various measures of erosion control with little success. Attempted erosion control measures have included bioengineering and burying old runway aircraft landing scrap metal. Several homes, as well as community infrastructure have been moved back from the bluff as the erosion has advanced. Several foundations have fallen over the edge of the bluff after buildings were evacuated.

Photos and Diagram

The attached photos of the bluff erosion were provided by the City of Kenai. A diagram is also attached depicting the linear extent of erosion in the community.

References

FEMA. 1981. *Flood Insurance Rate Map, Community Panel Number 020012 2030A.*

TAMS Engineers. 1982. *Bluff Erosion Study.*

USACE. 1997. *Reconnaissance Report for Navigation Improvements and Erosion Control Lower Kenai River.* Alaska District, U.S. Army Corps of Engineers.

USACE. 2003. *Kenai River Bank Stabilization, Reconnaissance Study.* Alaska District, U.S. Army Corps of Engineers.

USACE. 2006. *Kenai River Bluff Erosion Project Technical Report.* Alaska District, U.S. Army Corps of Engineers.

USACE. 2007. *Alaska Community Erosion Survey, OMB approved number 07100001*, expires September 30, 2009 received by facsimile from Rick Koch, Kenai city manager on August 8, 2007.

Additional Information

This information paper, as well as those for other communities, can be accessed on the internet at 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



Photo 1: Kenai River Bluff looking east toward Pacific Star Seafoods. September 2001.



Photo 2: Kenai River Bluff looking north from Cook Inlet mouth. September 2001.



Photo 3: Kenai River Bluff looking north along Willow Street. September 2001.



Photo 4: Kenai River Bluff looking north along Lake Street. September 2001.



Date of Aerial Photo: 18 April 02



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- - - - - Linear Extent of Erosion



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