



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

ALASKA BASELINE EROSION ASSESSMENT

Erosion Information Paper - Hyder, Alaska

Current as of February 22, 2008

Community Information

Hyder (HIGH-dur), population 92, is 2 miles from Stewart, British Columbia and 75 miles from Ketchikan. It is at the head of Portland Canal, a 70-mile-long fjord on the U.S./Canadian border. Hyder is accessible via a spur road off the Cassiar Highway through Canada. The community is unincorporated and in the unorganized borough.

Description of Erosion Problem

The community is on low, flat land at the mouth of the Salmon River. Erosion problems upstream of Hyder are the result of physical riverine processes. Periodic fluctuations in river flow and water levels, flooding due to runoff from melting snow, seasonal rainfall, and glacial outburst floods called “jökulhlaup” (Yo-kul-hloips) reportedly cause and contribute to erosion. Summit Lake is a self-draining lake above Salmon Glacier, the 5th largest glacier in Canada, and normally drains northward into upper Bowser River. The first recorded jökulhlaup was in December 1961 when Summit Lake drained under the glacier, raising the level of the river and filling it with icebergs. This caused catastrophic flooding in the Salmon River valley. The lake then began a cycle of filling, draining, and flooding the Salmon River, damaging the road and bridges along the river. The jokulhaup almost every year raises the water to flood level, deposits ice chunks along the river, and causes erosion.

Potential Damages

The Corps constructed an approximately 4,600-foot-long, 5-foot-tall, earth and rock dike along the left bank of the Salmon River in the 1930's to protect the community of Hyder from flooding. Approximately 1,500 feet of the levee along the Salmon River was washed out and the remainder was heavily damaged during a major flood-erosion event in December, 1961. The Corps visited Hyder in August, 2006 to assess the condition of the dike and determined it was in poor condition. Both faces of the dike were overgrown with alder and willow along the entire length. The Corps reported the side slope on the river side had steepened to a 1:1 ratio and was nearly vertical in places. The toe of the dike had been lost and in some areas the bedding layer had been lost or severely eroded.

The existing erosion area begins north of the earth-and-rock dike constructed by the Corps in the 1930's and continues up the frontage/access road for approximately 8.5 miles. The eroding riverbank is 10 to 15 feet high along the road. The affected road is one of two roads providing access to the community. It is the only road with access to the gold mines north of the community, the wildlife observation area, and the glacier overlook. The observation area, glacier overlook, and mines are significant tourist attractions considered essential to the economic

viability of the community. According to the *Southeast Alaska Jokulhlaups Report* by the National Weather Service Juneau Forecast Center, releases from Summit Lake caused major road/bridge erosion damage in 1961, washed-out two roads in 1965, caused minor damage in 1967 and 1968, washed out 3.5 miles of road in 1970, caused major road damage in 1973, and minor damage in 1971, 1972, 1974, and 2000.

The 8.5 miles of main access road north of the community and the utility poles and power lines are at risk from ongoing erosion and poor dike conditions. The Alaska Department of Transportation and Public Facilities Southeast Region are developing plans to address the problem. The Alaska Department of Transportation (DOT/PF) *Transportation Improvements Plan 2006-2009*, states, "Upgrade and pave Salmon River Road from the town site to the wildlife observation site at Fish Creek, plus the short segment of International Street that extends to the Stewart border crossing (3.9 miles). Project includes drainage improvements, guardrail where warranted, and abutment repairs at Bridge No. 1217 Fish Creek. Beyond the wildlife observation site, fortify the embankment by placing riprap at selected locations."

Photos and Diagrams

Attached are photos of erosion in the Hyder area. Also, attached is a diagram depicting the linear extent of erosion.

References

Davaris, Aimee, *Southeast Alaska Jokulhlaups Report*, National Weather Service Juneau Forecast Center. **Alaska DOT/PF**, *Alaska State Transportation Improvements Plan 2006-2009*, State of Alaska, Department of Transportation and Public Facilities.

USACE, 2006. *Inspection of Completed Works, Trip Report, Salmon River Flood Control Project, Hyder, Alaska*, August, 2006. Alaska District, U. S. Army Corps of Engineers.

USACE, 2008. *Alaska Community Erosion Survey*, OMB approved number 07100001, expires September 30, 2009 completed by Carol Denton, Hyder city administrator, on February 21, 2008.

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: The dike crest at the upper end of the project, looking downstream.



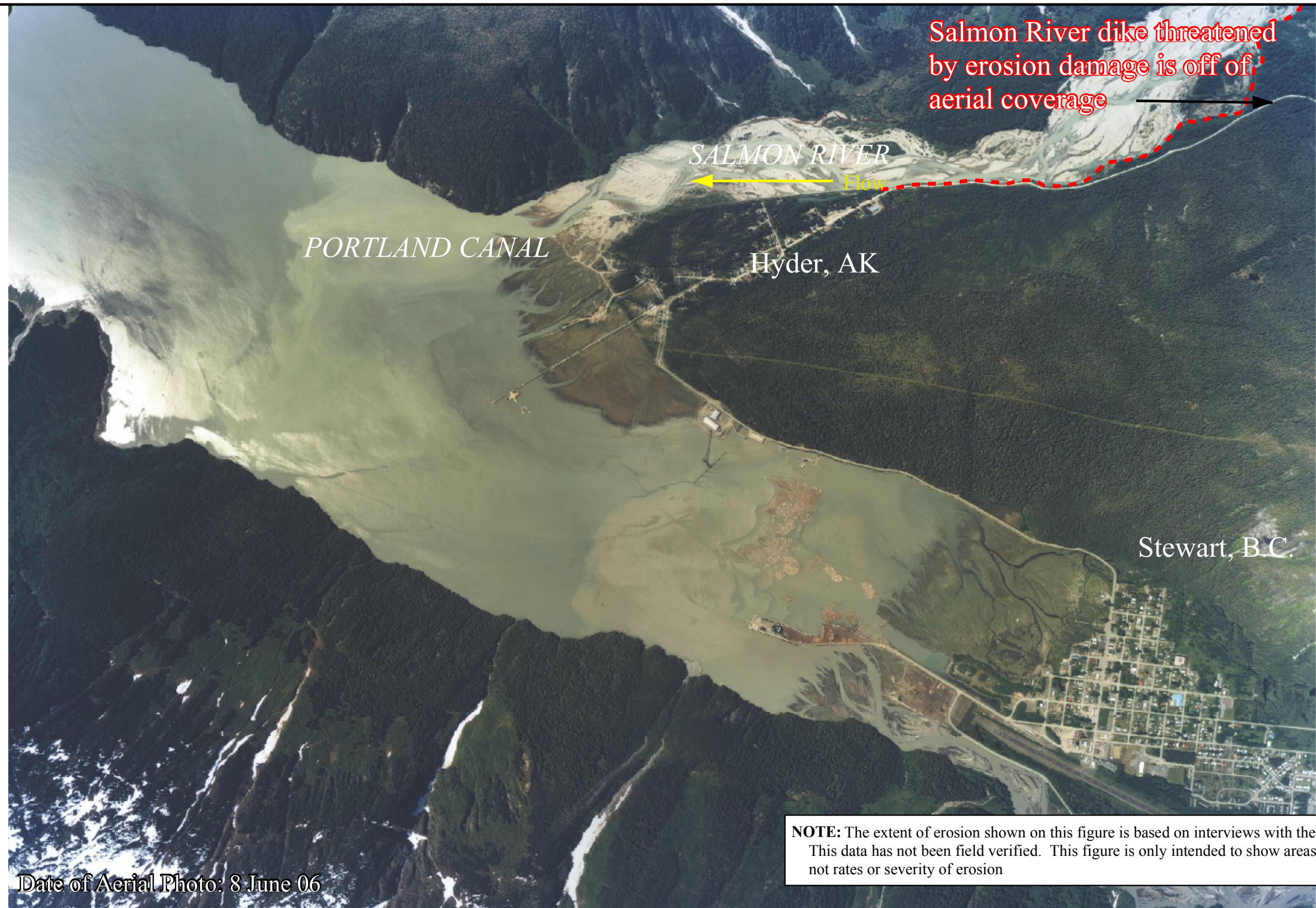
Photo 2: The dike side slope at the upstream end of the project. From the size of the material, it appears that the armor layer is totally gone. The side slope is approximately 1:1 rather than the constructed 2:1.



Photo 3: The river-side side slope of the dike near the downstream end of the project. This view shows the armor layer in place (at least the upper end of the layer). The dike top width here is 4-6 feet wider than most of the eroded upstream section of the project where the crest extends over the top face of the bedding and armor layers.

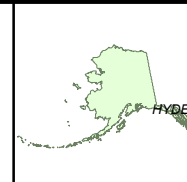


Photo 4: Debris in the river channel



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--- Linear Extent of Erosion



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