

Erosion in Napakiak, Alaska
May 10-11, 2018 Trip Report



Figure 1. Looking east at part of Napakiak on May 10, 2018. Rapid erosion threatens the entire community.

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Objectives

The purpose of this trip was to investigate the erosion that threatens Napakiak and to meet with community leaders to discuss strategies for mitigating erosion impacts.

The purpose of this report is to provide a summary of erosion-related issues and potential actions in advance of the 2018 Napakiak Hazard Mitigation Plan and 2018 Community Plan, which are expected to be released later this year by Ecology and Environment and the State of Alaska Division of Community and Regional Affairs, respectively.

Conclusion

The magnitude and rapidity of erosion in Napakiak require immediate action and long-term planning. Other studies have found that entire community of Napakiak will need to relocate to another site. However, few resources have been available to evaluate relocation options and to conduct planning. Napakiak's immediate priority is to relocate and replace threatened infrastructure, and to collect information that will inform long-term planning. The map below shows actual and predicted erosion.

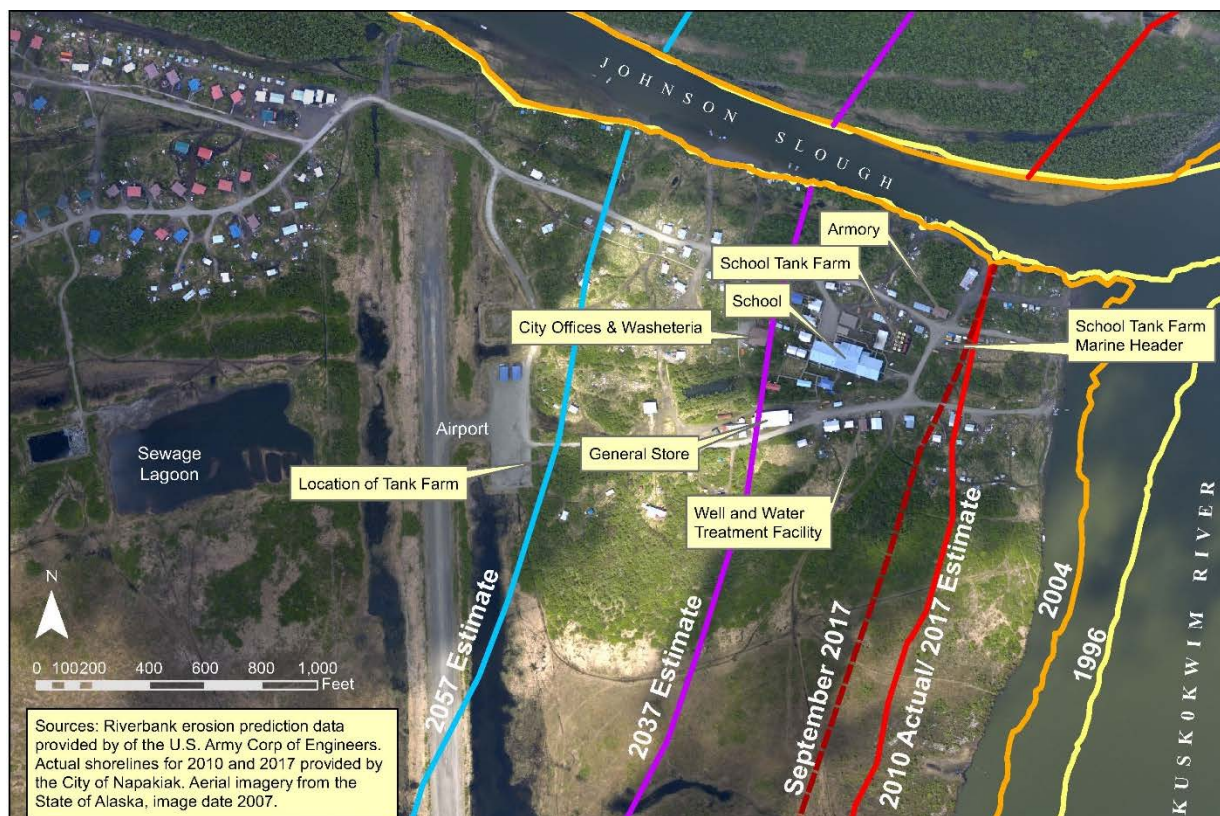


Figure 2. In some areas, erosion in Napakiak has occurred significantly faster than estimated by the US Army Corps of Engineers in 2009. Note the two red lines.

Erosion Rate

In some areas, the observed annual rate of erosion has been significantly faster than 25-50 ft. estimated by the US Army Corps of Engineers in 2009. According to the 2018 Napakiak Hazard Mitigation Plan, the community has lost up to 75 ft. of shoreline in one year. Furthermore, changes associated with a warming climate are likely to cause erosion to accelerate. Until accurate data from downscaled climate modeling are available, it would be prudent to use a conservative erosion rate, perhaps 75 ft. per year, when estimating erosion impacts.

Threatened Infrastructure

In March 2018, as part of Hazard Mitigation Plan development, Ecology and Environment measured the following distances between community facilities and the shoreline:

Facility	Distance from shoreline, HMP
Former National Guard Armory	139 feet
School	~200 feet
School Tank Farm	139 feet
School Tank Farm, Marine Header	65 feet

May 12-13 Storm Event

A storm immediately following my trip, on May 12-13, eroded up to 30 linear ft. of shoreline, according to Napakiak community members Richard Jung and Mike Black. The boat and hovercraft landing was destroyed. At 9:59 AM on May 13, Mike Black wrote the following to me in an email:

“It has gotten much worse, Mother’s Day update please we are under serious erosion and this is just the beginning of it, we still have a them summer storms and yet the harder fall storms, the armory and the school tank farms may be underwater by late fall of 2018 and there’s like 76000 gallons of stove oil or more at the school right now”

Near-Term Priority Actions

It is necessary to relocate buildings that can be moved, replace buildings that cannot be moved, and proactively replace infrastructure for which protection is impossible.

Community leaders discussed the following potential actions during the planning meetings on May 10 and 11. These will be finalized in the forthcoming Community Plan.

1. Replace the boat landing and hovercraft landing as soon as possible.
2. Relocate two armory buildings and two warehouses.
3. Relocate one to two homes.
4. Collaborate with Lower Yukon Kuskokwim School District to ensure school services are not interrupted by erosion. This may require building a new school on the west side of town and having discussions about collaborating on geotechnical studies and future options for water, sewer, electric, and heating utilities.
5. Hire a consultant to conduct a climate risk assessment for the current community location and potential relocation sites. This effort aims to support long-term planning by gathering the best available science regarding permafrost, flooding, and erosion impacts to infrastructure.
6. Begin community-based erosion and flood monitoring.
7. Work with the US Army Corps of Engineers to prevent erosion from damaging the community.



Figure 3. May 13, 2018 storm damage. Note the close proximity to the Napakiak school (right). Credit: Mike Black.



Figure 4. Erosion during May 12-13, 2018 storm event. Taken May 13, 2018. Credit: Mike Black.

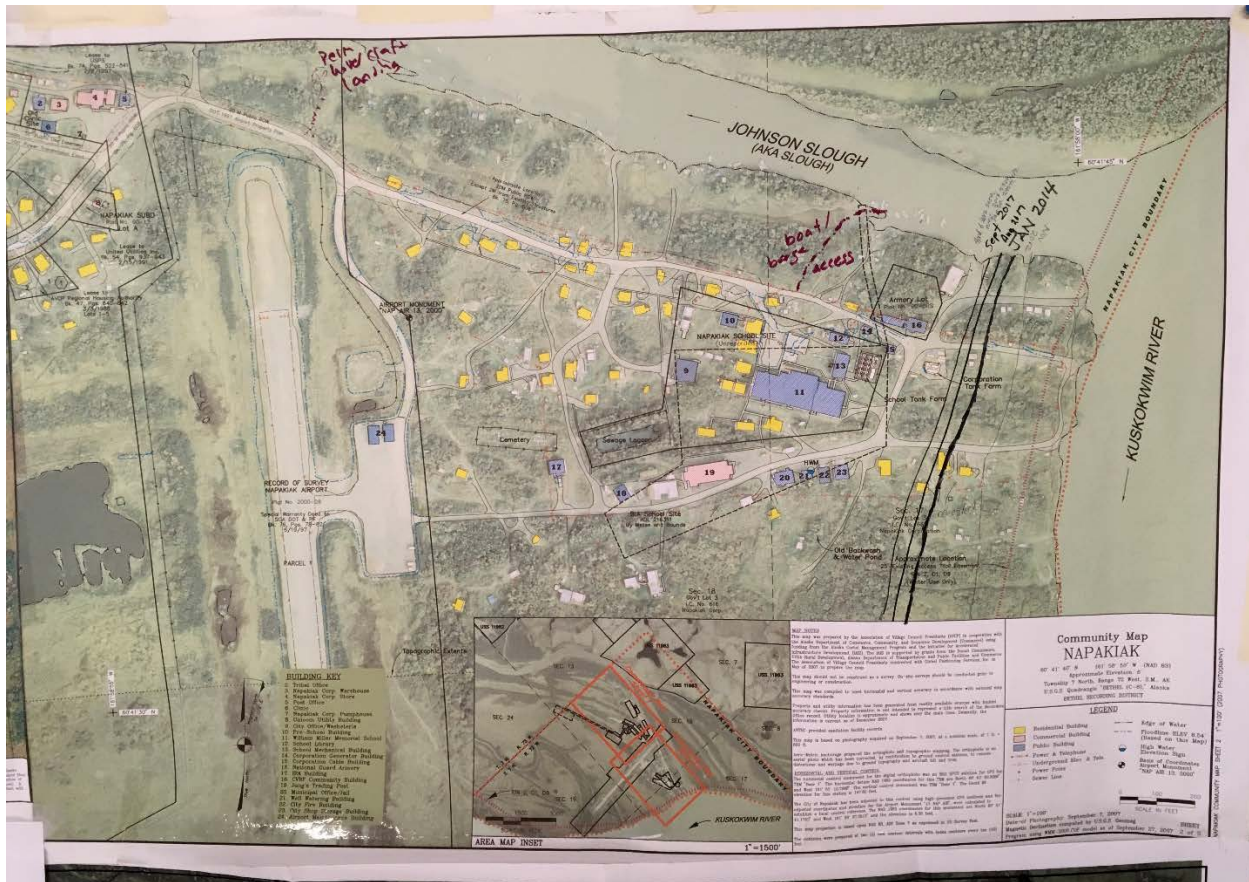


Figure 5. Photo of map used during community planning meetings. Lines show observed shoreline change and potential locations for replacement boat and hovercraft landing areas on the south side of Johnson Slough. May 11, 2018



Figure 6. LKSD fuel electric power infrastructure. May 11, 2018



Figure 7. Armory buildings on May 11, 2018. Note the Kuskokwim river in the background.



Figure 8. Armory building and road leading to boat and hovercraft landing area. May 11, 2018



Figure 9. Looking southeast at the damaged boat and hovercraft landing. May 11, 2018



Figure 10. Looking west at the damaged boat and hovercraft landing



Figure 11. Planning Meetings in Bingo Hall.

Trip Chronology

May 10, 2018

1:00 - 5:00 PM - I arrived in Napakiak and joined community leaders for a meeting in the Bingo Hall. Leaders were working for three days (May 9 – 11) to update the Five-Year Napakiak Community Plan with the Assistance of Diane Sam, a Local Government Specialist with the State of Alaska Division of Community and Regional Affairs. Upon my arrival, the focus of the meeting shifted to environmental hazards and we spent the next four hours discussing ways to mitigate impacts associated with the severe, accelerating erosion that is impacting Napakiak.

5:00 - 6:30 PM – I walked the shoreline of Johnson Slough from the Tribal office east to the Kuskokwim River and south along the shore of the Kuskokwim River.

May 11, 2018

8:00 -9:15 AM – I walked the shoreline photographing erosion impacts and nearby infrastructure.

9:15 – 10:00 AM – I met with Diane Sam to discuss community planning and strategies to address erosion.

10:00 AM – 12:00 PM – Community leaders continued developing a list of high priority actions to address erosion impacts.

12:50 PM – I began my return trip to Anchorage.

Meeting Participants

Nicholas Paul – Napakiak Corporation

Walter Nelson – City Council / Napakiak Corporation

Gordon Nelson – City Council

Sally Billy – IGAP

Michael Black – City Council

David Andrew – IRA Administrator

Melvin Andrew – IRA President

Jacob Black – IRA

George Berry – City Council

Richard Jung – Napakiak Corporation

Heather Kanule – AVCP Environmental Program

JoAnn Slats – City Mayor

Diane Sam – State of Alaska Division of Community and Regional Affairs

Max Neale – Alaska Native Tribal Health Consortium