Yukon

Carmacks Flood Hazard Mapping Public Engagement

What We Heard

Spring 2024

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Background

Flooding is becoming more common in the Yukon due to climate change and more extreme weather events. The Government of Yukon is working to better understand flooding in the territory to help build safer, more resilient communities. This report summarizes the public input on the Draft Flood Hazard Maps for Carmacks collected in January and February of 2024. The project was led by the Government of Yukon – Water Resources Branch ('WRB').

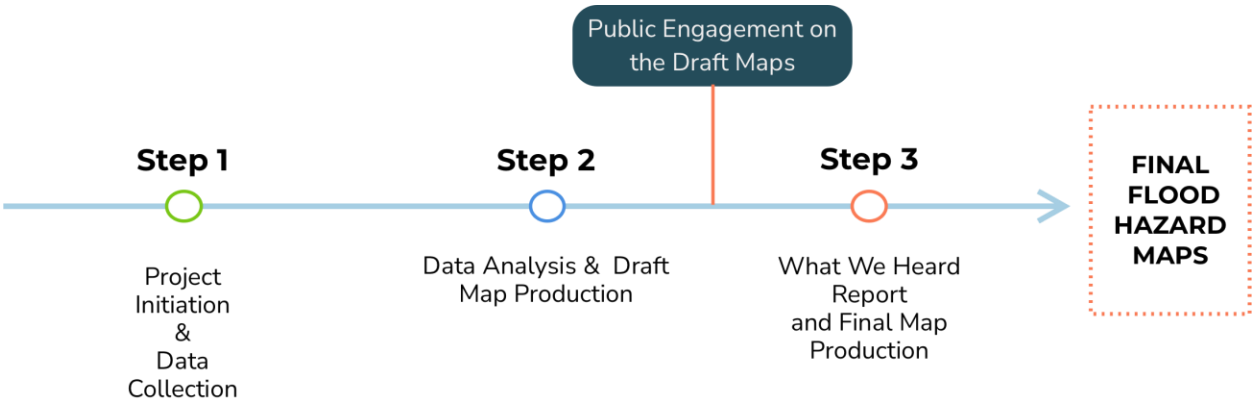
The engineering consulting firm, Stantec, was retained by WRB to generate the flood maps, which show areas that may be covered by water, or shows where the water reaches, during a specific flood event. 3Pikas, a local planning and facilitation team, supported the public engagement and facilitation on the draft maps and completed this documentation.

This 'what we heard' report summarizes feedback and comments received regarding the maps, as well as historical and potential future impacts of flooding in the community, desired next steps, concerns, and gaps.

Engagement process

We received feedback from the public at the following engagement events:

- Open house in Carmacks held January 25, 2024;
- Received input from Little Salmon Carmacks First Nation and the Village of Teslin; and,
- Online survey and online map viewer and public comment board from January 12 – February 8, 2024.



Purpose

The input on the draft maps helped inform updates and improvements to the final maps, which are now published.

How we engaged

We engaged the public using the following:

Flood Atlas:

- The Government of Yukon Flood Atlas webpage was updated on January 11 so the public could view and download the draft maps, complete the online survey, use the online map viewer tool, and provide comments and explore maps in detail at the in-person/online project open house.

Open House:

- An open house was held in Carmacks at the Recreation Centre January 25, 2024.
- The open house was hosted in person and online.

Survey:

- An online public survey was carried out from January 12 to February 8, 2024.

How we reached out

We communicated with the public using the following:

Engagement launch:

- The draft flood hazard maps public launch was on January 11, 2024.

- The launch included a news release on the Government of Yukon website.
- The news release included information about the project, the public open house date, and links to the Flood Atlas.

Government notification:

- Little Salmon/Carmacks First Nation (LS/CFN) and Village of Carmacks leadership were notified of the project prior to its start. Input was provided by LS/CFN at the scoping stage of the study to ensure the boundaries of the flood hazard mapping study addressed LS/CFN's interests (the study boundaries fully encompass the municipal boundaries for Carmacks).
- On November 7, 2024, WRB presented the flood hazard mapping project to the Village of Carmacks Council.
- On November 14, 2024, WRB presented the flood hazard mapping project to LS/CFN Chief & Council.
- The draft flood hazard maps were shared with LS/CFN and Village of Carmacks governments on January 4, 2024.
- LS/CFN and the Village of Carmacks were invited to participate at the open house and to have targeted meetings for staff and/or leadership.

Who responded

The engagement had the following participation:

- 15 people attended in person at the open house.
- Two people provided comments on the online draft maps.
- Three people responded to the online survey.

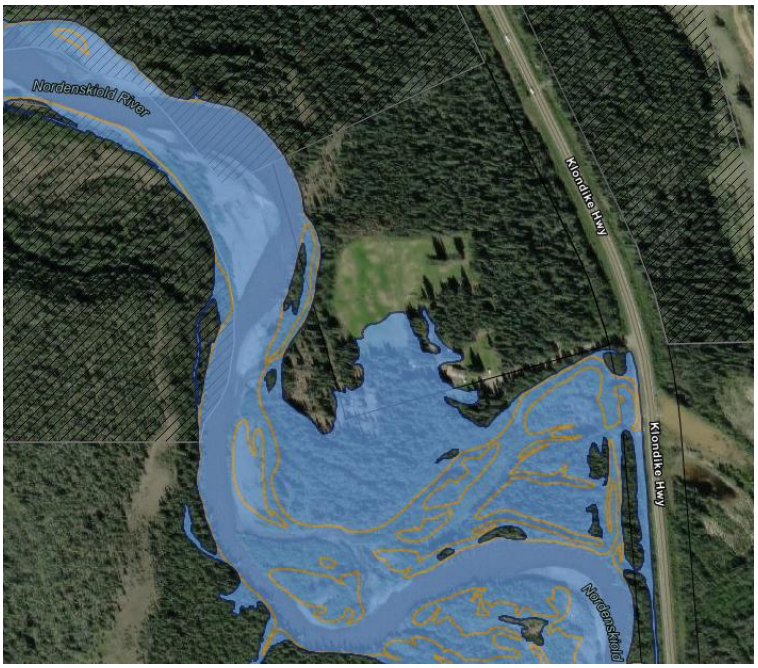
What we heard

Through the open house and the online engagement, we received comments and questions on a range of topics, which are summarized below.

Accuracy of the maps

- A resident talked about flooding on their property near the Nordenskiold River in 2023 during the spring open water freshet. A small channel off the Nordenskiold flooded around there recently. The area that was flooded in 2023 roughly matched the 5% (20-year) flood event shown on the draft maps (Figure 1).

Figure 1: Draft flood hazard map for the Nordenskiold River / North Klondike Highway (5% flood extent)



- All three survey respondents thought that the maps were accurate and that no at-risk community areas were missing from the maps.
- A resident questioned the area shown as inundated by Goulter Drive, north of the Nordenskiold River near its confluence with the Yukon River (Figure 2). They were not aware of a low area here.
    - The project team agreed the mapped results appeared unusual in this location. The ground elevations in this area were re-surveyed to confirm the

terrain model was accurate. Surveyed ground elevations were consistent with those being used in the maps.

Figure 2: Draft flood hazard map off Goulter Drive (0.5% flood extent)

Impacts of flooding on groundwater

- A participant asked: Did you look at the impact of groundwater? Does flooding affect our wells for drinking water?
    - The project team clarified that the flood mapping project did not consider groundwater, however WRB is expanding its network of monitoring wells, and this will be looked at more in the coming years.
- The group discussed the importance of the maps to inform other initiatives like better understanding groundwater flooding and water quality impacts.

Impacts of flooding on local infrastructure

- One participant asked if the project team looked at impacts of flooding on the bridge, can it withstand the 100-year flood?
    - The project team clarified that the potential impacts of flooding on existing infrastructure was not part of this project, but that the maps would inform this work going forward.

How individuals will use the maps

- Survey responses included a range of responses expressing how they would use the maps, including whether they would not use them, would use them for emergency readiness, and/or would use them for managing their property.
- We heard general interest at the public open house in using the maps to better understand risks to property and valued public areas around the village.

Options to reduce flooding impacts

- During a one-on-one discussion, a member of the public was interested to learn if it is possible to dredge out the middle of the river to lessen flooding.
    - The project team clarified that the Department of Community Services is supporting communities in their evaluation of flood mitigation options. Dredging the river was likely to be impractical given the high cost, feasibility challenges, and environmental impacts.

Discussions with local leadership and administration

Little Salmon/Carmacks First Nation raised the following points regarding the project:

- LS/CFN would like to learn more about the high-level, holistic flooding picture in the community, such as how does flooding impact the springs and wells that people access for drinking water as well as salmon health.
- They were also interested in learning more about the water quality impacts from untreated sewage discharged directly into the river from the wastewater treatment plant during flooding events.
- A follow up meeting to discuss these and other topics was requested.
- Residents on Goulter Drive and Tsawnjik Road (both in the Little Salmon Carmacks First Nation - Nordenskiold Subdivision) have observed impacts in their wells. Issues include large chunks clogging the manganese filters. These are seemingly related to elevated surface water levels in recent years leading to elevated groundwater levels.

Village of Carmacks highlighted the following regarding the project:

- Expressed that the Village of Carmacks would be very interested to see the flood map layers made available as GIS layers. The flood extents would be especially useful if they were in GeoYukon so you could look at them compared to other layers in GeoYukon.
- Discussed that there are locations in the community that have been suggested for residential development but may not be practical to develop based on the flood maps.
- Expressed that the maps were coming at a good time to inform the municipality's development planning to accommodate growth.
- Discussed wastewater treatment plant issues during flood events. It was expressed that these issues are part of why the Village would like to transition to a sewage lagoon to replace the existing plant in the future. There are other operational challenges with the wastewater treatment plant in addition to the flood related issues.
- The Village would like to see the potential lagoon locations that have been discussed with Government of Yukon in relation to the flood extents.
- Discussed how the recent flooding caused damage to the riverfront boardwalk and that there are rebuilding efforts currently underway.
- It was noted that a new housing development on River Drive has drainage issues during high water.
- A follow up meeting to discuss these and other topics with the Village of Carmacks Council was requested.

Key takeaways

The following are key takeaways from the discussions with LS/CFN and the Village of Carmacks:

- **Groundwater impact clarification:** The flood mapping project didn't include groundwater assessment, but WRB plans to expand monitoring wells in the future to address this concern.
- **Infrastructure resilience and the role of mapping:** While the project didn't evaluate impacts on specific infrastructure such as the Klondike Highway bridge, the maps will guide future evaluations. Additionally, the maps are valuable for

understanding groundwater flooding, water quality impacts, and exploring flood mitigation options like river dredging.

- **Approach and impacts:** There is an interest in understanding the holistic flooding impact on community wells and salmon health. There was a concern about water quality impacts from untreated sewage during flooding events.
- **Data:** There was an interest in accessing flood map layers as GIS data, especially if available in GeoYukon.
- **Implementation:** There is recognition that potential development areas may be constrained by flood maps. The timing of the delivery of flood maps was seen as beneficial for informing development planning. There is an interest in transitioning to a sewage lagoon to address issues with the current wastewater treatment plant.

Next steps

The public engagement on the draft flood hazard maps prompted constructive discussions and input from Carmacks residents, Little Salmon Carmacks First Nation, and the Village of Carmacks.

Feedback received helped the Government of Yukon finalize flood hazard maps for the Southern Lakes communities.

The Water Resources Branch's commitments to Carmacks residents going forward include:

- Reviewing, and if necessary, adjusting the mapping results for one area where local knowledge of the area did not fit with what the draft maps showed.
- Following up with Little Salmon/Carmacks First Nation and the Village of Carmacks to schedule meetings to continue to discuss the project, its connection with other community concerns, and potential next steps.
- Final flood hazard maps for Carmacks are now released.