



Southern Lakes 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 Southern Lakes, encompassing community areas on the shores of Lake Laberge, Marsh Lake, Nares / Bennett Lake (Carcross), and Tagish Lake collected in January and February of 2024. The project was led by the Government of Yukon's Water Resources Branch ('WRB').

The engineering consulting firm, KGS Group (KGS), 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 (see Section **Error! Reference source not found.**). 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.

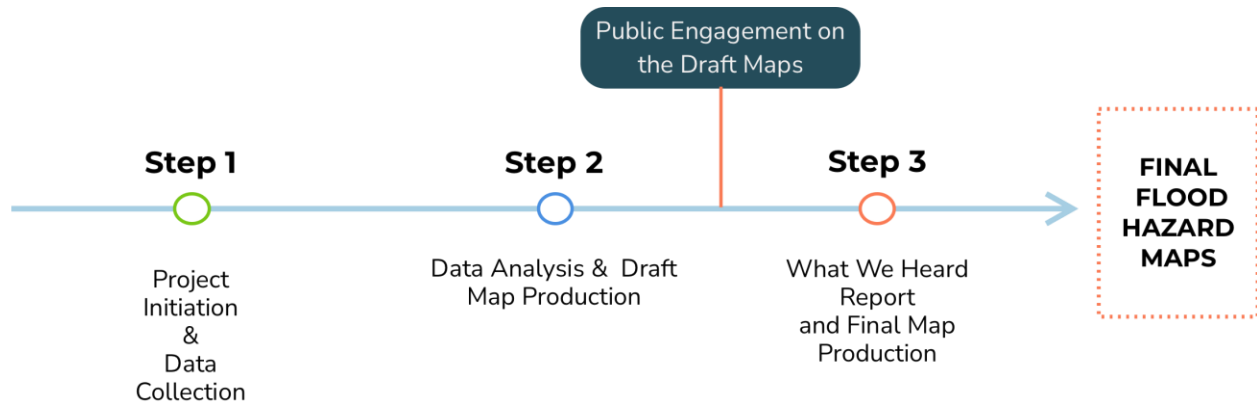
Engagement process

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

- an online survey, online map viewer and public comment board was open January 12 to February 8, 2024;
- An open house was held at the Haa Shagóon Hídi in Carcross on February 5, 2024;
- An open house was held in Marsh Lake at the Marsh Lake Community Centre on February 6, 2024;
- An open house was held at the Hootalinqua Community Centre / Fire Hall in Lake Laberge on February 7, 2024;
- an open house was held in Tagish held at the Tagish Community Centre on February 13, 2024; and



- We invited input from government staff of the Carcross / Tagish First Nation (C/TFN), Ta'an Kwäch'än Council (TKC), and Kwanlin Dün First Nation (KDFN), and received input from TKC and KDFN.



Purpose

The input on the draft maps helped inform updates and improvements to the final flood hazard 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, 2024 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 open houses.

Open House:

- Open houses were hosted in the communities of Carcross, Marsh Lake, Lake Lebarge and Tagish.

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, public open house dates, and links to the Flood Atlas.

Government notification:

- Carcross / Tagish First Nation (C/TFN), Ta'an Kwäch'än Council (TKC), and Kwanlin Dün First Nations (KDFN) leadership were formally notified of the project prior to its start, and appropriate points of contact for the project within each government were confirmed. Input was provided by TKC and KDFN early in the study to ensure the boundaries of the flood hazard mapping study addressed their interests.
- Targeted meetings were offered to C/TFN, TKC, and KDFN staff. Meetings were held with TKC Lands, Resources and Heritage and KDFN Heritage, Lands and Resources representatives.

Who responded

The engagement had the following participation:

- Open Houses:
 - Eight people attended the Carcross open house.
 - 28 people attended the Marsh Lake open house.
 - 13 people attended the Lake Laberge open house.
 - Eight people attended the Tagish open house.
- 24 people responded to the online public survey, of which 22 reported being Southern Lakes residents.
- Three comments were made on the online map viewer in the Marsh Lake mapping area, and six in Lake Laberge.



What we heard

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

Carcross

1. Specific comments regarding the accuracy of the draft flood maps:

- We heard feedback from individual residents about their experiences during past flood events and observations of flood extents on their properties and the community.
- Generally, the draft maps for the 1% (100-year) flood scenario aligned with participants' experiences during the 2021 flood.

2. General comments on the flood hazard mapping project:

- Participants asked questions regarding the technical aspects of flood mapping, including the underlying assumptions used, whether erosion processes were investigated, and the selection of flood scenarios for mapping, given climate change is an increasing risk.
- Participants were interested in how the maps considered the impact of infrastructure such as the Lewes Control Structure (i.e., on sediment flow and water levels) as well as erosion and historical flood events.
 - **Response:** *The project team explained to the open house participants that water level records prior to the Lewes Control Structure being built were not available. The modelling assumes that the control structure will continue to be used in a manner similar to the current regime, which has minimal impact during flood events, as the control structure's gates are completely open during these conditions.*

3. Historical context and environmental impacts of recent flooding:

- At the open house, participants provided input on historical flooding events and sediment transport patterns.
- There was interest in whether C/TFN oral history (e.g., flood stories, raft on Fox Mountain) and historical records (e.g., White Pass historical dredging of Nares River) were incorporated into the flood maps.
 - **Response:** *The project team explained that the analysis focused on local observations and empirical data in more recent years (since the construction of the Lewes Control Structure).*

- There were questions from participants regarding groundwater inputs and their potential impacts on flooding and groundwater wells.
- Participants shared concerns about the condition of critical infrastructure like the Lewes Control Structure, Whitehorse Rapids Generating Station, and groundwater wells in flood-prone areas, indicating a need for continued monitoring and maintenance.

4. Emergency flood response and community support:

- Participants asked about emergency response protocols during floods, including the military's involvement and the availability of community support measures.
- There was a range of feedback on past flood response efforts, including concerns about the adequacy of assistance and resources provided to affected residents in Carcross during the most recent flood event in 2021.
 - **Response:** *The staff member present from the Emergency Measures Organization provided an explanation of how emergency resources are allocated based on requests from the local community's emergency responders.*
- There was recognition of the crucial role of community engagement and support networks during flood events, emphasizing the importance of effective communication and coordination.

Marsh Lake

1. Specific comments regarding the accuracy of the draft flood maps:

- One survey respondent thought the flood levels depicted in the draft flood hazard maps differed a lot compared to those experienced at Grayling Creek in 2022.
 - **Response:** *Based on the modelling, WRB expects flood levels in the 1% flood scenario to not match with the flooding in 2022.*
- We heard residents express concerns about the accuracy of the maps in reflecting individual property mitigation efforts.
 - **Response:** *At the public open house WRB and KGS clarified that most of the elevation data was captured in summer 2022, so upgrades after that would not be captured. Further details on how the maps were developed, the recency of data used, and limitations for site-specific interpretation will be provided with the release of the final maps.*



- Participants shared their feedback on the maps, including the need for clearer visualization of flood levels and overlapping of the different flood scenarios, as well as more clarity on map symbols and boundaries (e.g., road names and First Nation Settlement Lands).
 - **Response:** *This input was considered in revisions to the final map formatting.*
- We heard that participants online and at the open house wished to see the approximate flood extents from the 2021 and 2022 flood events visualized on the maps.
 - **Response:** *Historical water level data is generally limited to the hydrometric stations, which specify the water surface elevation at one location on the lake. Generating inundation maps for past events was outside the scope of this project.*

2. General comments on the draft flood hazard maps:

- Participants asked how local observations, such as photos of water levels and experiences of past floods, informed the mapping project.
 - **Response:** *The project team presented how historical records, such as photos and field observations, helped validate the flood extents modelled by KGS.*
- We heard questions about the confidence level in the flood maps and whether recent water level events were factored into calculations.
 - **Response:** *WRB clarified that when completed, the final maps should have a high level of accuracy and that technical information about how the maps were made will be shared publicly.*
- There was a question regarding the absence of consideration for climate change risks in the 20-year (5%) and 100-year (1%) flood maps.
 - **Response:** *WRB acknowledged the potential value in climate change scenarios for other flood events.*
 - **Response:** *A second climate change scenario, for the 5% / 1-in-20-year event, will be included with the final maps.*
- Some open house attendees and survey respondents expressed interest in seeing the complete methods / approach (i.e. technical report) accompanying the draft maps, including how climate change is considered.
 - **Response:** *WRB / KGS clarified the different guidelines and approaches used to create the maps at the public open house. WRB will publish a*



detailed technical report and shorter plain language summary of the mapping methods with the final maps.

- Participants suggested including a more holistic approach to understanding water levels and incorporating groundwater data/impacts from high water tables during floods to future flood hazard maps.
- One respondent indicated that they do not want public money to contribute to mitigations to others' private property.
- One survey respondent wished to see Government of Yukon implement flood mitigation work on government owned properties and infrastructure (e.g., access roads). This participant also suggested that public roads currently convey flood waters around property owners' barriers, leading to worse inundation impacts on these properties.
- Similarly, one participant suggested that landowners who are unwilling to take action to mitigate flooding impacts on their property put adjacent properties at higher risk.

3. Environmental changes:

- Some participants observed erosion and sediment deposition in specific lakeside areas (public lands) near Judas Creek Road after the 2021 and 2022 flood events.
- Residents commented that recently, wind events have become more severe and frequent on Marsh Lake.

4. Residents' concerns for the future:

- Some participants raised concerns about the maps showing flood risk on existing properties and their potential implications for obtaining home insurance and lowering property values.
- There was a concern regarding whether individuals would be able to sell their residential properties that had higher flooding risk.
- We heard concerns from some residents about accelerating erosion on public lands and within property boundaries, especially after the 2021 and 2022 flood events.
- Some participants mentioned their concerns about potential environmental and off-property impacts from individuals' shoreline armouring efforts. Some participants expressed concern that the overall or cumulative impacts of individual shoreline armouring is not well understood on Marsh Lake.

5. How residents intend to use the flood hazard maps:



- In the survey, we heard most Marsh Lake residents respond that they intend to use the final flood hazard maps to assess flood readiness and manage their homes.

6. Project updates and future planning:

- There was discussion on the frequency of map updates and considering changing timeframes due to climate change.
 - **Response:** WRB clarified that updates will be completed periodically for the maps.
- Participants asked how shoreline changes will be incorporated into the maps in the future.
 - **Response:** WRB clarified that new map data (LiDAR), and field surveys will be completed to inform future updates to the flood maps.
- One respondent wished to know if there were plans for relocation initiatives for some residents, and for local tax base to contribute to flood protections for residential property owners.

Lake Laberge

1. Specific comments regarding the accuracy of the draft flood maps:

- A participant identified a technical error on the online mapping at a height of land near Jackfish Bay Point (the error was not present in the PDF maps).
 - **Response:** WRB clarified that this was an error, and it has since been remedied.
- Participants shared that extensive shoreline vegetation (e.g., willows) in certain areas limited wave run-up during the last two flood events in 2021 and 2022.
 - **Response:** It was noted that some of the mapped wave run-up inundation areas might be less extensive because of the shoreline vegetation at these locations. It is difficult to consider smaller vegetation (such as willows) in the mapping process.

2. Environmental changes:

- Participants shared their observations on changing environmental factors, including shifting and less predictable wind patterns on the lake, shortening of the period where boat access is possible, and changes to the lakebed.

3. Resident's concerns for the future:



- Concerns were raised about the impact of motorboats on shoreline erosion, and inquiries were made about measures to prevent future development and protect existing wetlands.
- Participants highlighted the need for financial and technical support for flood recovery and flood resilience efforts.

4. Impacts of upstream water management during flood events:

- Participants asked about how the management of Schwatka Lake water levels and flows through the Whitehorse Rapids Generating Facility during the flood events in 2021 and 2022 potentially impacted flood levels in Lake Laberge.

5. Groundwater impacts to properties in Shallow Bay:

- Participants shared their observations on rising groundwater affecting property basements and septic systems.
- We heard interest in further examination of the relationship between groundwater levels and flooding events, with a focus on multi-year trends.
 - **Response:** WRB clarified that while the draft flood maps do not address groundwater flooding, WRB installed new groundwater monitoring wells in Shallow Bay and understands that groundwater is high around the territory. Observations suggest groundwater levels may follow a longer multi-year oscillation. They will learn more as they continue to expand monitoring and the datasets grow.

6. Government collaboration, guidance, and policy integration:

- Participants asked questions about the involvement of various government departments in flood mapping initiatives and the connections between flood mapping and wetlands policy, land use planning, and development regulations.
- A participant emphasized the importance of wetlands for flood mitigation and the need for heightened protection (e.g., Wetland Policy).
- Participants requested guidance from Government of Yukon for homeowners to enhance flood resilience, including assistance with sump pump installation and basement design choices.
- Participants asked for coordinated policy efforts and zoning regulations to manage development in flood-prone areas and ensure effective flood mitigation strategies.
- Participants shared that broader discussions among different government departments to address flooding challenges comprehensively is important.



Tagish

1. Specific comments regarding the accuracy of the draft flood maps:

- Participants observed that the orientation of the PDF draft flood hazard maps appears to change (i.e., North is not always at the top of the page).
 - **Response:** WRB noted this concern and will look at making sure the orientation is more obvious in the final maps (e.g., different layouts and / or larger north arrows).

2. General comments on the draft flood hazard maps:

- We heard feedback that the flood hazard maps should be easily accessible for individuals who are not proficient in using computers (e.g., a hard copy should be available at the Tagish Library).
 - **Response:** WRB can provide hard copies to community libraries for public use.

3. Resident's concerns for the future:

- Individual residents expressed concerns about their properties being inaccurately depicted as flooded on the maps, seeking clarification and assistance in interpreting the flood extent.
- Some participants raised concerns about the potential impact of flood maps on insurance premiums and the ability to obtain overland flood insurance, highlighting the need for clarity on policy implications.

4. Climate change and flood frequency:

- There was an inquiry regarding how WRB is anticipating worsening flooding conditions due to climate change.
 - **Response:** WRB confirmed at the open house that the risk of flooding in the Southern Lakes is increasing with climate change and that the 0.5% plus climate change flood scenario is meant to show this.

5. Government collaboration, guidance, and policy integration:

- Participants asked that the flood mapping work be integrated into local planning initiatives such as ongoing Local Area Planning and Tagish River Habitat Protection Planning.



6. Erosion and boat speed control:

- Participants talked about how, during past flood events, folks boating on the Tagish River who did not live around Tagish seemed to be unaware that their wakes were causing erosion.
- Participants made several comments about implementing formal erosion control measures similar to those in place in British Columbia.
- Participants discussed stricter controls on boat speed, including the establishment of a no-wake zone, to mitigate erosion caused by boat activity during floods.

7. Importance of groundwater monitoring and management:

- Participants emphasized that groundwater levels are rising and asked that more resources be allocated to understand and mitigate the impact of this.

8. Ongoing community engagement and follow-up:

- We heard a desire for more information and updates going forward, especially regarding erosion control and groundwater management.



Next steps

The public engagement on the draft flood hazard maps prompted constructive discussions and input from Southern Lakes residents.

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

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

- Reviewing modelled flood extents for any areas where local knowledge of 2021 flooding did not match the 1% flood scenario.
- Providing further detail on the topographic data that was used for the maps and the limitations for site-specific interpretation (such as seeing the impact of private property mitigation measures).
- Releasing a detailed summary of the methods used to prepare the draft / final flood hazard maps.
- Continuing collaboration with C/TFN, TKC, and KDFN on mapping flood hazards in their Traditional Territories and supporting First Nations governments in applying the mapping to land planning decisions.
- Continuing correspondence with Local Advisory Councils, including responding to any follow-up questions.
- Final flood hazard maps for the Southern Lakes communities are now released.

