Fort McMurray flood study details

This document provides answers to common questions about the Fort McMurray flood study.

What area does the flood study cover?

The Fort McMurray flood study assesses and identifies river-related hazards along 15 km of the Athabasca River, 20 km of the Clearwater River, and 5 km of the Hangingstone River, through Fort McMurray and the Regional Municipality of Wood Buffalo.

When was the flood study conducted?

The study started in fall 2015 and technical work was completed in summer 2023.

Will flood maps from this study replace any older flood maps?

Yes. When the draft flood study is finalized, it will not only replace the older Fort McMurray flood study (which was completed in 1993) but will expand coverage. The new study will replace 12 km of older mapping and add 28 km of new mapping through areas never mapped before.

Was the draft study shared with my local authority?

Yes. Draft reports and flood maps were provided to affected municipalities between February 2017 and July 2022, for information and to obtain feedback as the first step of the study finalization process.

What reports and flood maps are included in the study?

The study includes multiple reports that document the collection of survey and base data, summarize the hydrology assessment, describe the hydraulic model creation and calibration process, present the open water and ice jam flood modelling results used to create flood maps, illustrate the information used to define the floodway and flood fringe, include the flood hazard maps, assess and inventory flood risks, and investigate channel stability. Open water and ice jam flood inundation maps are provided in separate flood inundation map libraries.

Is this the first public engagement for the study?

No. Public engagement on draft flood inundation maps, which show areas at risk for different sized floods to help with emergency response, and related reports was completed in August 2020.

Were any changes made since the last round of public engagement?

Yes. In response to feedback we received, supplementary ice jam flood frequency analysis was undertaken to incorporate information from the 2020 spring ice jam flood. Although no significant changes to the ice jam flood maps were required, revisions were made to the draft ice jam assessment report to summarize the supplementary work.

What is the purpose of this round of public engagement?

This round of public engagement focuses on draft flood hazard maps, which define floodway and flood fringe areas to help with long term planning.

Most of the draft reports were shared with the public in our first phase of engagement, and some have been revised to address feedback or correct factual errors or omissions. Reports being shared for the first time include the flood hazard mapping and risk assessment reports. Copies of the draft flood hazard maps are also included in the "Governing Design Flood Hazard Mapping Report", but they are easier to explore using our online flood map viewer.

What causes flooding along the rivers covered by the study?

Flooding typically occurs because of high river flows or ice jams. We are aware that there may be other sources of flooding in the area, including groundwater flooding or flooding caused by local drainage issues, but the focus of this study is on riverine flooding caused by high river flows or ice jams.

What is the difference between open water and ice jam flooding?

Open water floods are typically caused by high flows driven by heavy rainfall, either alone or combined with snowmelt runoff, and are typically more of a risk in the spring and summer. In contrast, ice jam floods are caused by river ice breakup in the early spring season.

What type of flooding is shown in the draft flood hazard maps?

Flood hazard maps are based on 1:100 ice jam design flood levels where ice jam flooding is more severe than open water flooding. Ice jam flooding is the design condition used for flood hazard mapping along the Athabasca and Clearwater Rivers, with ice jam design flood levels calculated assuming that fully developed ice jams occur on both rivers simultaneously. A combination of open water and ice jam flooding is the design condition for the Hangingstone River.

Why don't the maps match the flooding we experienced in past years?

It would be unusual for a flood map to perfectly match a past flood, due to different river flows, variations in local conditions, and assumptions made for the study. Flood maps are based on theoretical floods with different chances of occurring, including the 1:100 design flood used for flood hazard mapping. Draft flood maps from the new study do not represent any specific recent or historic flood.

Does the study include new or planned Fort McMurray flood berms?

Partially. Our draft flood inundation and flood hazard maps reflect the protection provided by flood berms in place as of fall 2016, when the original surveys for the new study were completed. However, we are aware the Regional Municipality of Wood Buffalo has continued to work on new flood berms since then and has a plan in place for more flood mitigation to improve community resilience.

The draft floodway aligns with future flood mitigation plans and does not extend behind either existing or planned flood berms. This means that the new floodway is significantly smaller than the previous floodway. Almost all of the currently-developed parts of Fort McMurray have been removed from the previous floodway or not included in the floodway in areas being mapped for the first time.

While we do not yet show the protection provided by new or future berms, it will be reflected in our online flood maps when the full flood mitigation system is completed. When this occurs, and it is established that the system provides complete protection for the 1:100 ice jam flood, most flood fringe and high hazard flood fringe areas in downtown Fort McMurray along the Clearwater River and around the TaigaNova development along the Athabasca River will be remapped as protected flood fringe areas.

What will happen if flood berms are built or upgraded in the future?

Flood studies are typically based on river conditions, floodplain topography, and flood mitigation infrastructure present or in final design stages at the time a study is conducted. If new community-level flood berms are constructed in the future, or existing flood berms are upgraded, we will assess the potential impact on calculated flood levels and flood maps. If impacts are significant, revisions to the flood maps will be considered.

How has climate change been considered?

The potential effects of climate change were assessed as part of the hydrology assessment. In general, the effect of climate change on Athabasca, Clearwater, or Hangingstone River flood flows is uncertain. Given this uncertainty, various climate change scenarios were not explicitly modelled. However, the potential impact on flood levels from increased 1:100 flood flows was assessed, and this information can be considered by communities if desired.

Where can I learn more about provincial flood studies?

Review our “General information about flood studies” fact sheet to learn more about provincial flood studies, including how flood maps are developed and how flood inundation and flood hazard maps are used.

Visit www.floodhazard.alberta.ca for more information about the Flood Hazard Identification Program.

The website includes more details on different types of flood maps and how to view them using our online flood map viewer, as well as individual web pages listing our draft and final flood studies.

Contact

Email us at epa.flood@gov.ab.ca for more information about our public engagement for draft flood studies, or if you have questions about the Flood Hazard Identification Program.