Flood Mapping Basics

What are flood maps and why are they important?

Flood maps identify the areas covered by water during historic or potential future floods. They are important tools for:

- land use planning (safely locating and designing buildings, roads and other infrastructure)
- flood mitigation activities (for example, raising roads, berms, or improving drainage)
- emergency preparedness (considering evacuation routes),
- increasing public awareness.

Why are new flood maps being created now?

To help Canadians better plan and prepare for increased flood risks in a changing climate, the Government of Canada is providing financial and technical support to provinces and territories to develop new flood maps for higher-risk areas through the Flood Hazard Identification and Mapping Program. This support allows provinces and territories to create these flood maps with newly available information, methods and technology.

An agreement between Natural Resources Canada and the Government of the Northwest Territories Department of Environment and Climate Change was signed to support new flood mapping and related activities through to March 2028.

What are the types of flood maps in the NWT and how do they differ?

There are two types of flood maps in the NWT - flood inundation maps and flood hazard maps.

Flood inundation maps show where the water went during a past flood. In the NWT, most flood inundation maps show the highest flood on record. They are usually created using high-water marks, satellite imagery, aerial photos, community observations, or engineering studies of how water moves. Flood inundation maps are typically used for community emergency planning and response.

Flood hazard maps show the area that would be covered by water during a flood with a specific chance of happening in any given year. The specific chance is called the annual exceedance probability (AEP). These maps are usually created through detailed engineering studies and may rely on some of the same information used to make flood

inundation maps. Flood hazard maps are typically used for community land use planning and flood mitigation planning.

What do flood hazard maps show?

Flood hazard maps display the flood hazard area. This is the entire area at risk of flooding and it is usually divided into two parts – the floodway and the flood fringe.

The floodway includes the river and any parts of the flooded area where the water is predicted to be deepest, fastest and most destructive, or where moving ice is expected to be present during ice-affected floods. This is the area where flood water and/or ice pose the greatest risk to people, property and infrastructure.

The flood fringe includes parts of the flooded area where water is predicted to be shallower, slower and less destructive, and where moving ice is not expected during ice-affected floods. Flood impacts in this area are generally less severe than within the floodway.

What does the term annual exceedance probability (AEP) mean?

The annual exceedance probability (AEP) is the chance that a flood of a certain size will happen in any given year. For example, a flood with a 1% chance of occurring in any given year is called a 1% AEP flood, which is the same as a 100-year flood. This does not mean that a flood that size happens only once every 100 years – it could occur more or less often. A 1% AEP (or 100-year flood) is more likely to occur in any given year than a 0.5% AEP (or 200-year flood). Examples:

- A 100-year flood (1% AEP): a flood event with a 1% chance of occurring or being exceeded in any given year.
- A 200-year flood event (0.5% AEP): a flood event with a 0.5% chance of occurring or being exceeded in any given year.

What influences the choice of AEP?

The AEP selected for mapping can affect community land use planning and flood mitigation decisions. Planning based on 100-year flood (1% AEP) carries inherently greater long-term risk than planning based on a 200-year flood (0.5% AEP) because a 200-year flood has the potential to be more damaging than a 100-year flood.

What is riverine flooding?

Riverine flooding is also referred to as fluvial flooding. It occurs when water flows outside of a river, stream, or creek channel and onto normally dry land. Causes may include ice jams, heavy rainfall and snowmelt. Riverine flooding is the most common type of flooding in the NWT.

Which NWT communities are at highest risk of riverine flooding?

The NWT communities at highest risk of riverine flooding are Aklavik, Fort Good Hope, Fort Liard, Fort Simpson, Fort McPherson, Jean Marie River, Hay River, Kátł'odeeche First Nation, Nahanni Butte and Tulita.