Highways, Hydrology & Climate Change

Assessing the water-related effects of climate change on Yukon’s northern highways

CONTEXT
The climate of northern regions has become warmer and wetter over the last three decades resulting in degrading permafrost and changing vegetation. In addition, a warming climate has already altered the hydrology – the distribution, movement, and quality of water – of Yukon, resulting in more frequent and intense flooding that has negative and expensive impacts on transportation infrastructure.

APPROACH
Sensitivity to water changes and associated permafrost thawing will be assessed along the Dempster Highway Corridor. Using a range of climate change planning scenarios, assessments will be carried out within the eight distinct ecological regions that the Dempster Highway traverses. Weather stations have been installed along the highway where they do not already exist in order to supplement data collected at existing stations.

EXPECTED RESULTS
This initiative will generate a summary of projected hydrological changes that may result from climate change along the Dempster Highway. It will also develop flood frequency projections based on annual peak flows for Dempster Highway stream crossings. These products will allow for the development of adaptation strategies and options, which may include infrastructure design modifications.

OBJECTIVE
To better understand how Yukon’s water cycles (precipitation, evaporation, runoff, etc.) are changing, and to use computer-generated models of past and future climate changes to develop better ways to respond to these changes along the Dempster Highway.

Significance
Developing hydrological response projections will assist in adaptation planning and may reduce negative impacts of climate change on northern transportation infrastructure.

Partners
- Highways & Public Works, Government of Yukon
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