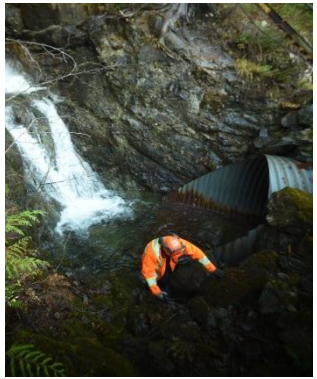
Accounting for Climate Change Impacts in the Design of Resource Road Crossings

(Webinar 3 of 3) From Snowmelt to Streamflow: Data Portals for Future Hydrologic Conditions + Discussion: Climate Change Tools Needs for Crossings Design



June 25th, 2020

Arelia Schoeneberg, M.Sc. Hydrologist, Pacific Climate Impacts Consortium

Kari Tyler, M.Sc. User Engagement & Training Specialist, Pacific Climate Impacts Consortium

Matt Kurowski, M.Sc., EIT Research Engineer, FPInnovations

Join at
slido.com
#fpi

- The session will start at 10:00 PST / 13:00 EST
- All lines will be muted during presentations
- This webinar will be recorded and posted to FLNRORD website
- **Interact! Vote on polls and ask/upvote questions – all anonymous by default**

www.slido.com event code: **fpi** (any browser – smartphone or computer)

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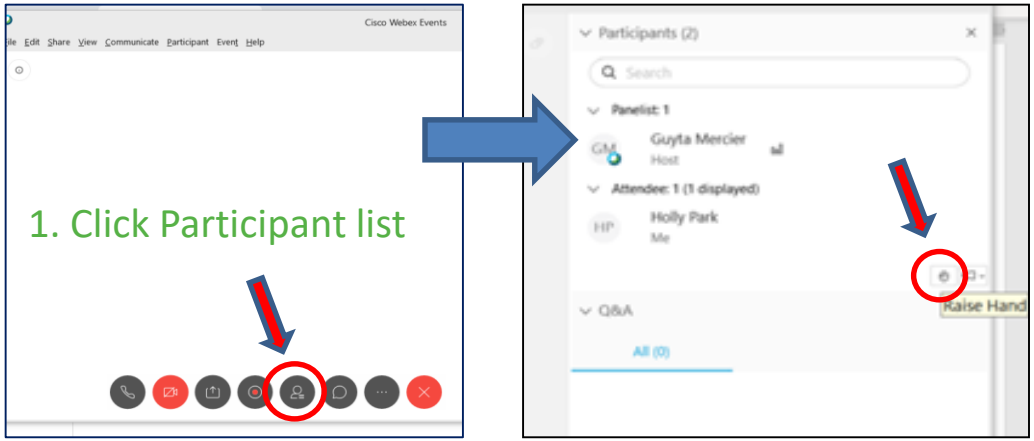
PACIFIC CLIMATE IMPACTS CONSORTIUM

BRITISH COLUMBIA Ministry of Forests, Lands, Natural Resource Operations and Rural Development

Speaking & Questions/Comments – WebEx ID

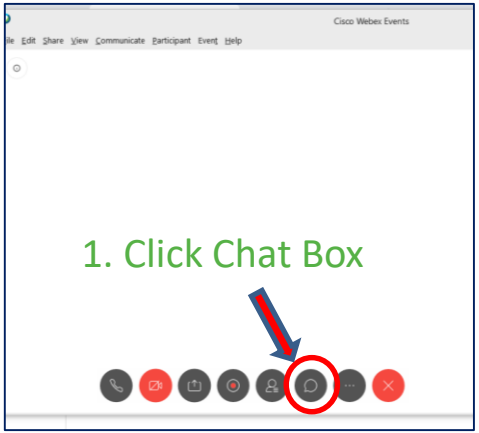
1. Use WebEx to voice a comment/question

2. A Menu pops up – click “raise hand”



2. Use WebEx Chat to

- ask tech support questions
- comment/question using WebEx login ID (publicly or privately)



Questions/Comments/Polls – Anonymous

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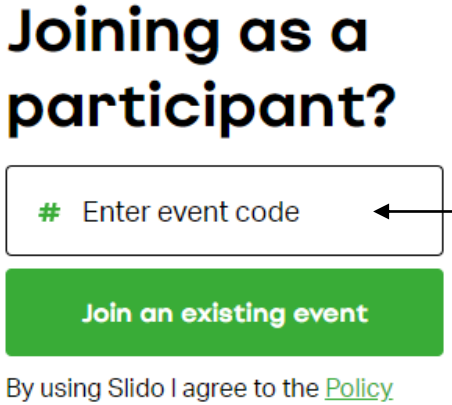
Influence the presentation:

- Vote on polls
- Ask/upvote questions
- Anonymous by default



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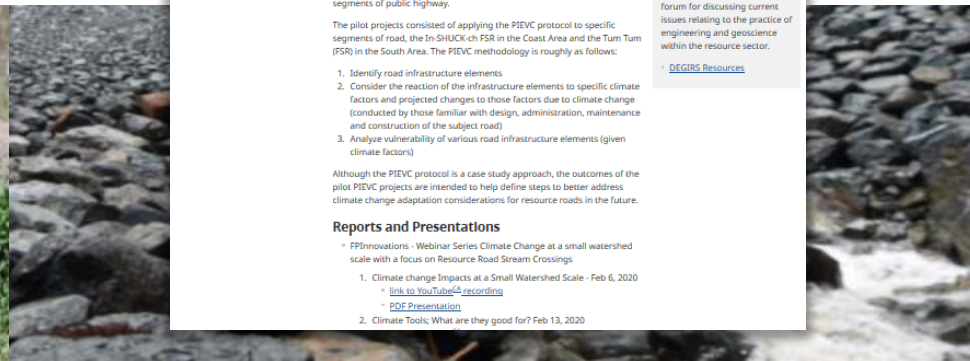
Webinar Overview

- Brian Chow, Chief Engineer, FLNRORD (few minutes: overall context)
- Matt Kurowski (few minutes: webinar series context)
- Arelia Schoeneberg, (30 minutes)
- Kari Tyler (30 minutes)
- Discussion…

BRITISH COLUMBIA | Ministry of Forests, Lands, Natural Resource Operations and Rural Development

This webinar series was developed in coordination and with funding from the Ministry of Forests, Lands, Natural Resource Operations and Rural Development

https://www2.gov.bc.ca/gov/content/industry/natural-resource-use/resource-roads/climate-adaptation



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- Resource Road Safety Information
- Forest Service Road Standards & Guidelines
- Engineering Publications & Permits
- Radio Communications
- Guidance for Oil & Gas Activities
- **Climate Change Adaptation**
- Engineering Equipment & Services

Climate Change Adaptation for Resource Roads

Climate change impacts can result in significant damages to resource road infrastructure which may be disruptive to road access and costly to repair. Recent storm flood damage on public and resource roads are illustrative examples. Although storms are a normal occurrence, climate change has caused storm events to happen more frequently and with increased intensity.

A Climate Change Vulnerability Assessment Approach for Resource Roads – FPInnovations February 2020

Given the benefits that resource roads provide to economic and social well-being, it is important to understand the impacts of a changing climate on resource roads and infrastructure. As the forest industry and governments move toward creating resource roads that are resilient to climate change, an early step in the adaptive management process is to assess the risks and vulnerabilities of infrastructure to climate change.

This report provides the recommendations and considerations for applying a vulnerability assessment to resource roads.

Pilot PIEVC Projects

Two pilot projects were initiated on Forest Service roads (FSR), in collaboration with Sea-to-Sky and Okanagan-Shuswap Resource Districts focused on climate change vulnerability of resource road infrastructure. The PIEVC protocol is a climate adaptation assessment process developed by the Public Infrastructure Engineering Vulnerability Committee (PIEVC). The PIEVC protocol provides a structured methodology for assessing infrastructure for climate change vulnerability so that modifications to processes and procedures can be identified in planning, design, maintenance and implementation. The PIEVC protocol entails the engagement of stakeholders, as participants in a workshop, that are knowledgeable with the subject road having used, maintained and administered it. The participants contribute to the process by exercising judgement based on their knowledge of the road and how it has reacted to inputs, such as previous storms and other management applications. The MFLNRORD engaged with the Ministry of Transportation and Infrastructure to assist with the delivery of the In-SHUCK-ch FSR given their leadership and experience with applying the process on numerous segments of public highway.

The pilot projects consisted of applying the PIEVC protocol to specific segments of road, the In-SHUCK-ch FSR in the Coast Area and the Tum Tum (FSR) in the South Area. The PIEVC methodology is roughly as follows:

1. Identify road infrastructure elements
2. Consider the reaction of the infrastructure elements to specific climate factors and projected changes to those factors due to climate change (conducted by those familiar with design, administration, maintenance and construction of the subject road)
3. Analyze vulnerability of various road infrastructure elements (given climate factors)

Although the PIEVC protocol is a case study approach, the outcomes of the pilot PIEVC projects are intended to help define steps to better address climate change adaptation considerations for resource roads in the future.

Reports and Presentations

- FPInnovations - Webinar Series Climate Change at a small watershed scale with a focus on Resource Road Stream Crossings
  1. Climate change Impacts at a Small Watershed Scale - Feb 6, 2020
     - link to YouTube recording
     - PDF Presentation
  2. Climate Tools; What are they good for? Feb 13, 2020

Climate Change

The impacts of a changing climate can affect resource roads and the communities that use them.

- Climate Change in B.C.

Landslides

This handbook presents a framework for landslide risk management and describes technical methods of landslide risk analysis. It is intended for terrain stability professionals and forest resource managers.

- Landslide Risk Case Studies

Forest Investment

The Land Based Investment Strategy guides ongoing resource investments and short-term targeted investments in British Columbia's natural resources.

- Land Based Investment

DEGIRS

The Division of Engineers & Geoscientists in the Resource Sector (DEGIRS) provides a forum for discussing current issues relating to the practice of engineering and geoscience within the resource sector.

- DEGIRS Resources

- **Orientation:** updates on topics from first series (Matt Kurowski)
- **A first look:** the new Plan2Adapt tool (Kari Tyler)
- **Review:** use of two tools that were not included in the first series (Columbia Basin Climate Source and climatedata.ca), a prototype tool that calculates risk probabilities of climate indices, as well as a case study crossing in Southeast B.C. that applies these tools (Mel Reasoner)

June 18 (Thursday)
Updates and Developments in Climate Change Tools for B.C. + Case Study from the Southern Interior
Matt Kurowski EIT (FPInnovations), Kari Tyler (Pacific Climate Impacts Consortium), Mel Reasoner (Climate Resources Consulting)

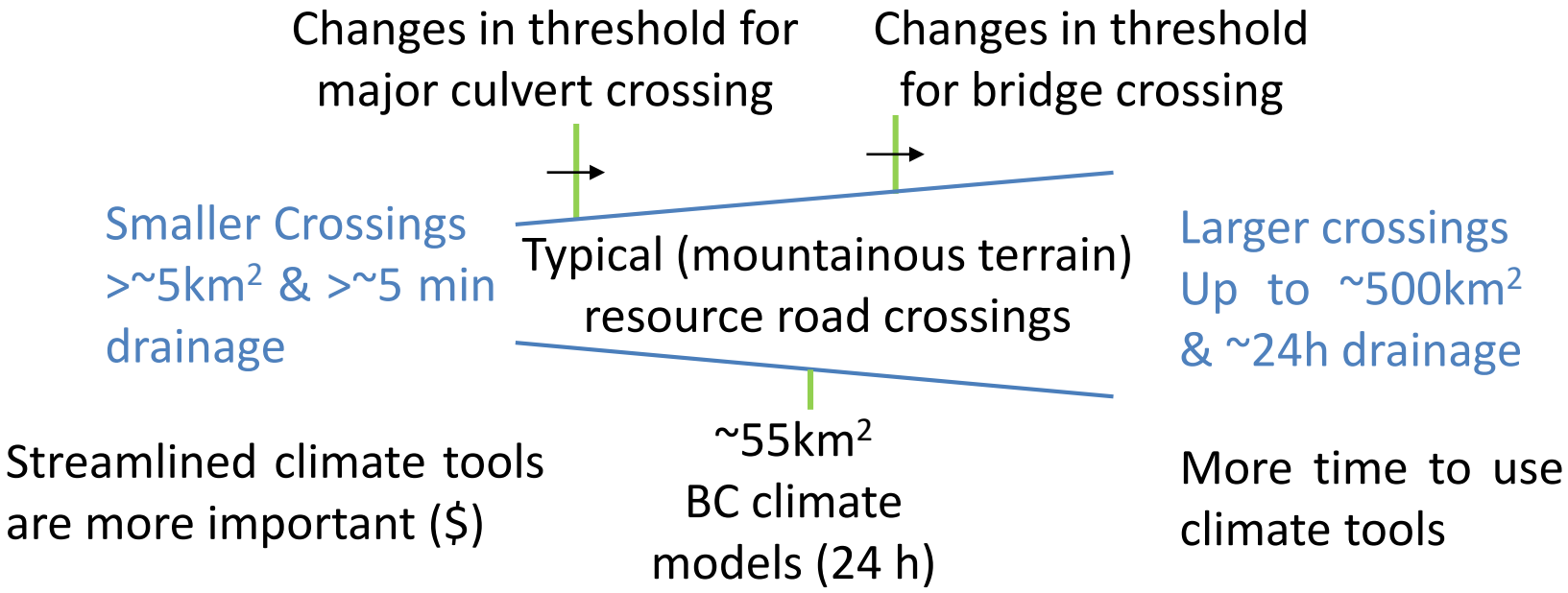
- **Crossing case studies in Coastal and Northern B.C. ranging in drainage size:** how data and methods used in design flood hydrology relate to uncertainties of climate projections from various tools, and how climate projections can inform design (Lee Deslauriers and Paul Mysak)

June 23 (Tuesday)
Case studies from the Coast and Northern B.C.
Lee Deslauriers P.Eng., RPF (StoneCroft Engineering), Paul Mysak P.Eng. (Onsite Engineering Ltd.)

- **Introduction:** a data portal from the Pacific Climate Impacts Consortium that provides streamflow for a range of future climate conditions in sub-basins of the Peace, Fraser and Columbia (Arelia Schoeneberg)
- **Facilitated conversation with designers:** applied use of climate tools (Kari Tyler)

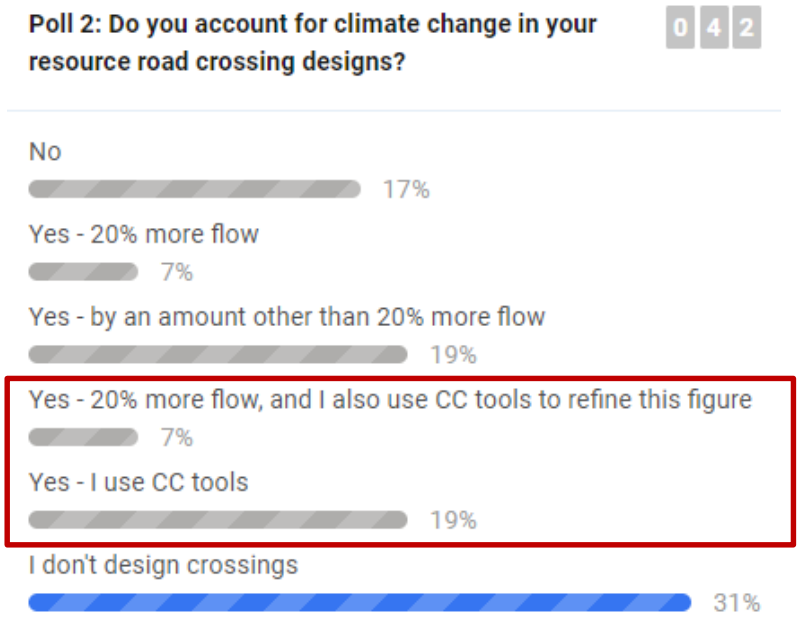
June 25 (Thursday)
From Snowmelt to Streamflow: Data Portals for Future Hydrologic Conditions + Discussion: Climate Change Tools Needs for Crossings Design
Arelia Schoeneberg, Kari Tyler (both from Pacific Climate Impacts Consortium)

Climate Tool: map that shows or uses climate indices



Crossings designers: seem to be using climate tools more - especially in terms of precipitation, not yet as much effort with respect to snow

Feb 2020



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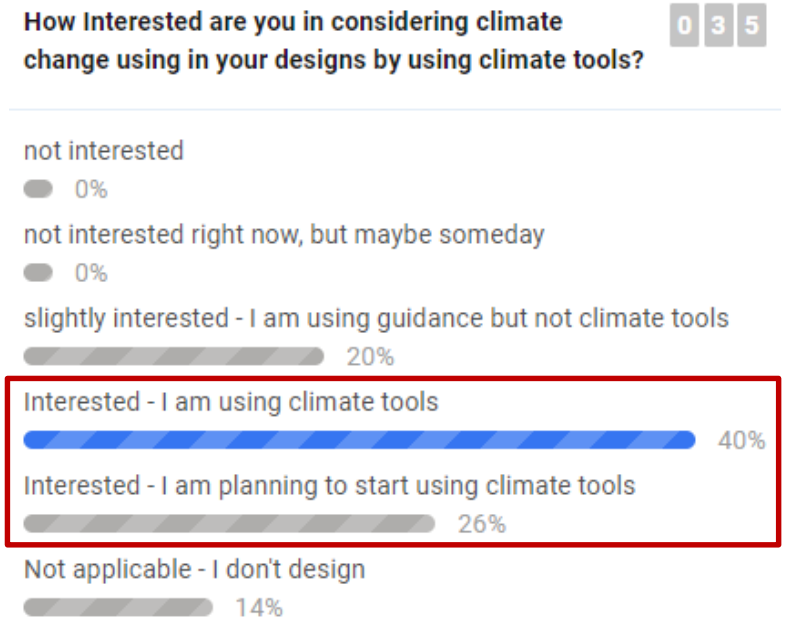

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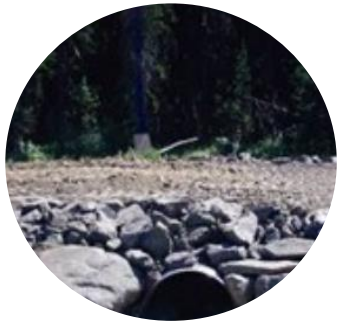
Thank you



Matt Kurowski
Research Engineer
FPInnovations

matt.kurowski@fpinnovations.ca