Scoping and Modelling Overview

Main Table Meeting

Outline

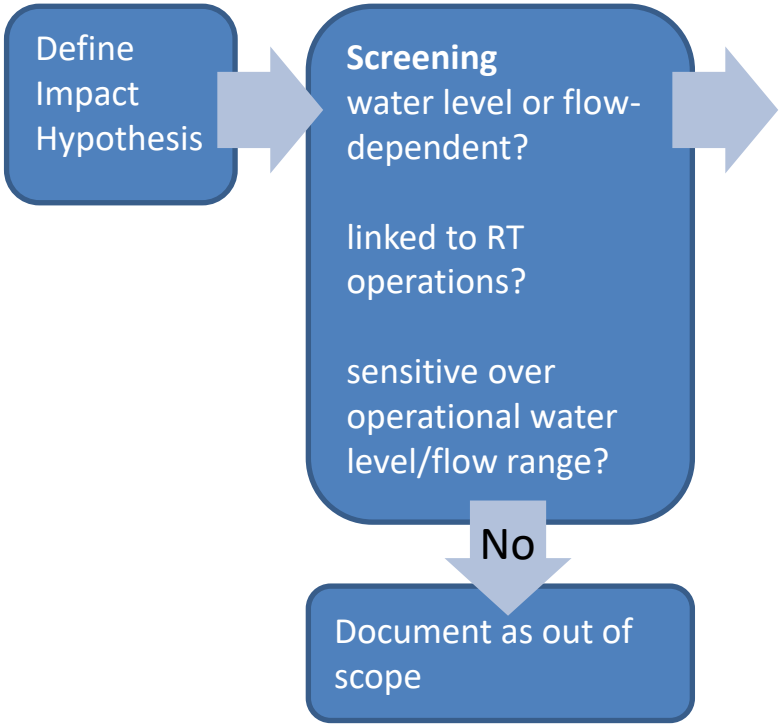
- Issues scoping - Jenn
- Modelling overview - Katie
- Example consequence table - Jayson
- Proposal for July meeting

Issues Scoping

Overview of Issues Scoping

Define Impact Hypothesis

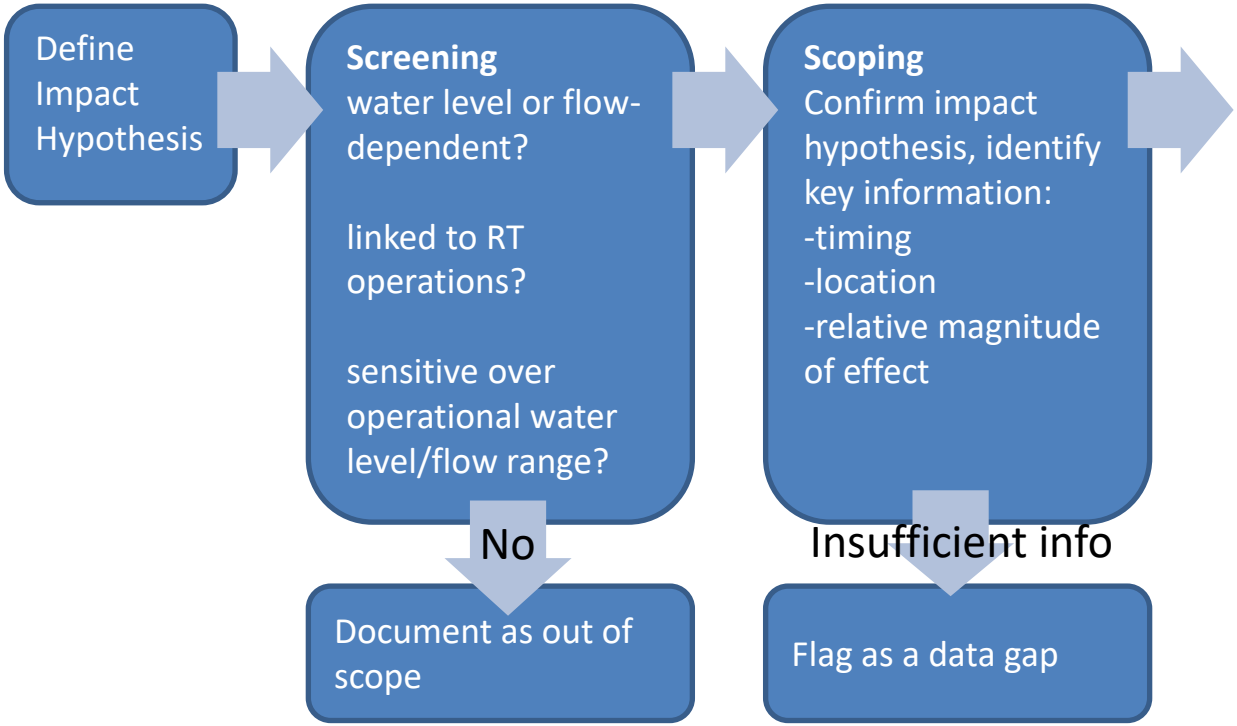
Overview of Issues Scoping



Out of Scope – LWD Restricting Caribou Migration

- Caused primarily by reservoir formation
- No explicit link to operational control
- Current studies of LWD removal to address this issue

Overview of Issues Scoping



Data Gap –Shoreline Steepness Restricting Caribou Migration

- No specific information to confirm impact hypothesis
- Known
  - Timing: spring migration for calving
- Unknown
  - magnitude of effect
  - location

Overview of Issues Scoping

Define Impact Hypothesis

Screening
water level or flow-dependent?

linked to RT operations?

sensitive over operational water level/flow range?

No

Document as out of scope

Scoping
Confirm impact hypothesis, identify key information:
-timing
-location
-relative magnitude of effect

Insufficient info

Flag as a data gap

PM development
Gather information to develop performance measures

Redundant or no info

Adopt proxy PM

Proxy PM – Overwintering flows

- Suitability of OW habitat is related to reservoir operation and water level
- Related issue: need provide flows OW to protect eggs
- Assumption: incubation flows are sufficient OW flows
- Use incubation flow as an interim proxy PM

Overview of Issues Scoping

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PM development
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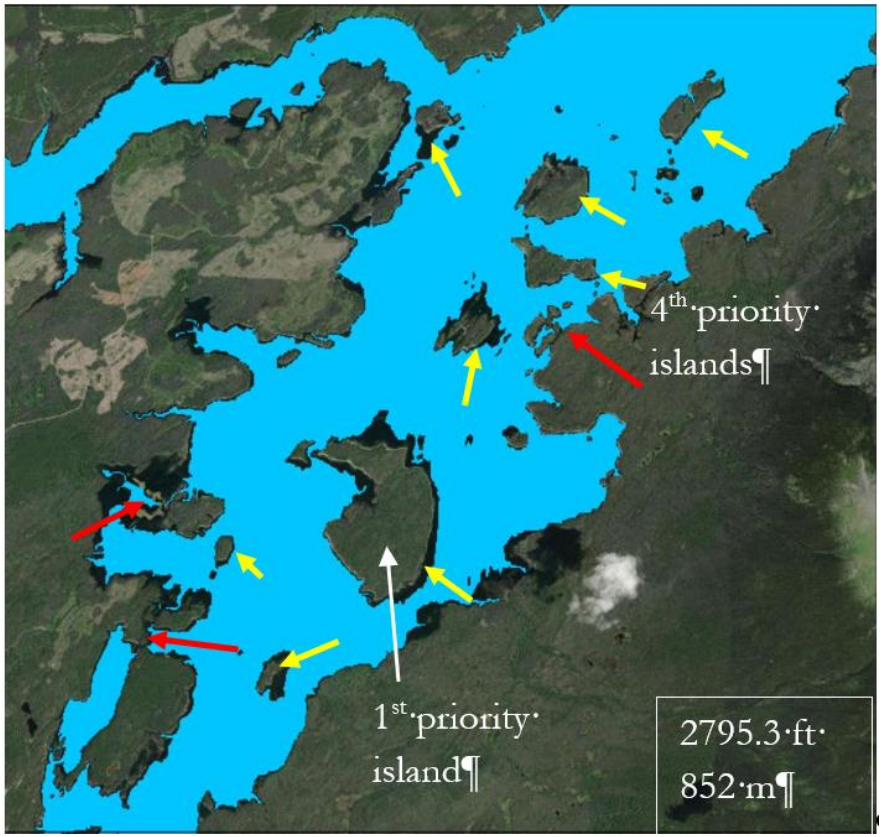
Adopt proxy PM

Develop specific PM

New PM – Caribou Calving Islands



Red arrows = land bridge

Yellow arrows = isolated islands

Most islands isolated for elevations > 852m

PM: Days where reservoir elevation is less than 852 m between May 1 and June 30

Preferred low: high

Existing PM – Overbank Flooding at Vanderhoof

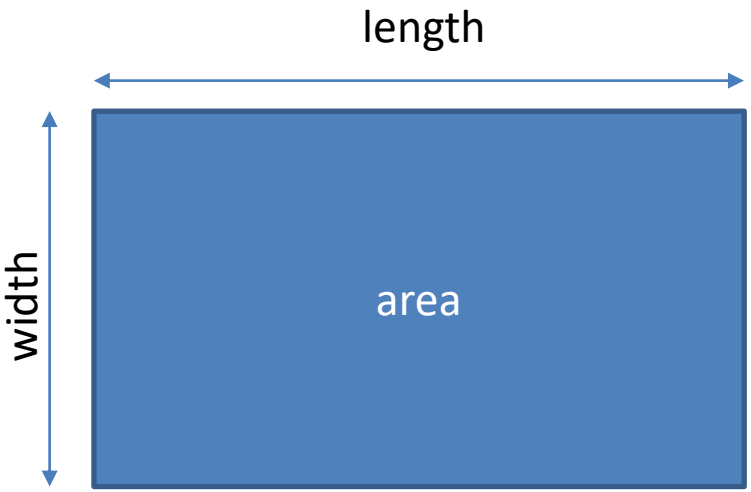
- RT operational flood criteria = 550 m^3/s at Vanderhoof

List of Studies

- Nechako Reservoir wetland assessment
- Nechako Reservoir wildlife assessment
- Entrainment risk assessment
- Ramping assessment
- Reservoir erosion and driftwood: development of best practices
- Water temperature effects on salmon literature review
- River Erosion: attributing factors literature review
- Nechako Reservoir productivity, water quality and thermocline

Modelling Overview

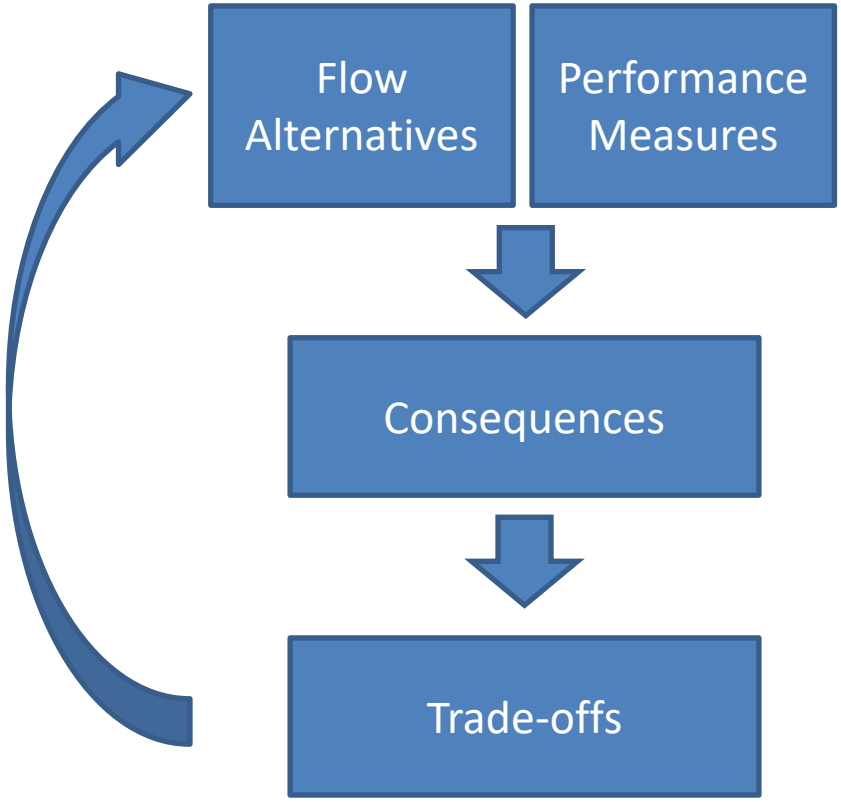
What is a model?



- Description of the “real world”
- Simple example:
  - Area = length * width
- Use to evaluate alternatives
  - How does area change if we double the width?
  - How can we maximize planting area, given available perimeter?

Why modelling in SDM?

- Modelling allows us to efficiently ‘experiment’ with different flow alternatives
- Modelling provides:
  - Structure
  - Transparency
  - Predictions



Types of models for Nechako

Model Type	Output	Responsibility
RT Flow Model	Water level and flow for each alternative	RT (based on alternatives from Main Table)
Performance Measures (multiple)	Relationship between objectives and flow	Technical Experts (based on objectives from Main Table)
Consequences	Consequences of different alternatives on objectives	Main Table

Framework to evaluate trade-offs provides structure and transparency

Example Consequences Table

Example consequences table

Objective	PM	Direction	Units	Alternative			
				1	2	3	4
Objective 1	1a.	L	days				
	1b.	L	masl.				
Objective 2	2a.	H	m²				
	2b.	H	days				
Objective 3	3a.	H	%				
	3b	H	days				

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Reduce PMs

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Develop new alternatives

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Develop new alternatives

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Proposal for July Meeting

Next meeting, we'd like to..

- Provide more detail on the flow model and modelling for specific PMs
- Present a sample consequence table for some interim PMs and trial alternatives
- Discuss trade-offs between the trial alternatives

Performance Measures for Interim Calculations

Objective	Interim Performance Measure	Preferred Direction
Minimize temperature effects on salmon migration	Average daily flow at Vanderhoof between July 1 and Sept 30	High
Minimize salmon incubation mortality (also proxy for overwintering)	Difference between average spawning flow and minimum incubation flow at Cheslatta Falls	Low
Minimize fish stranding mortality	Maximum daily change in water level at Cheslatta Falls	Low
Minimize land connections to caribou calving islands	Days where reservoir elevation is less than 852 m between May 1 and June 30	Low

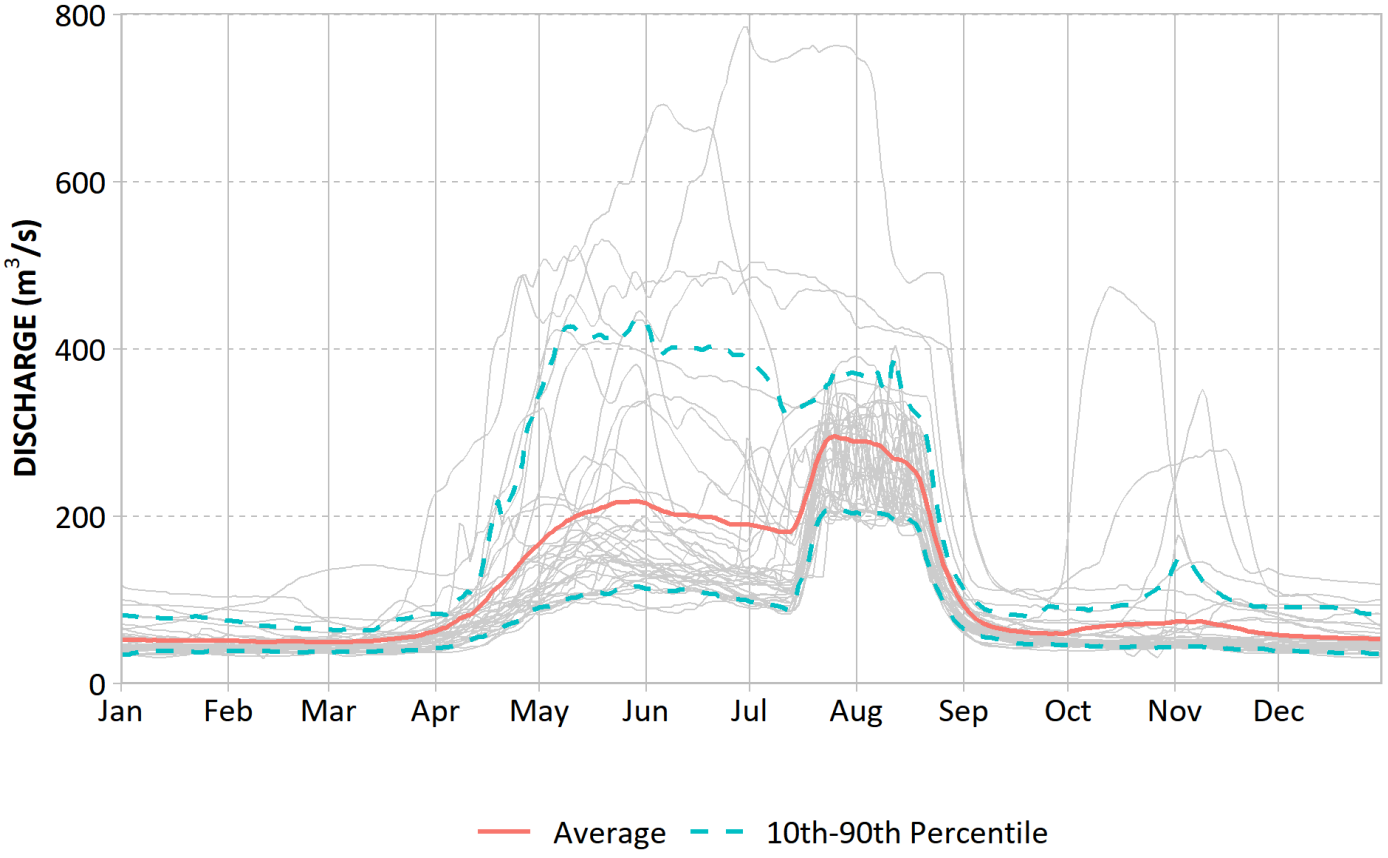
Performance Measures for Interim Calculations

Objective	Interim Performance Measure	Preferred Direction
Minimize inundation and erosion of gravesites	Number of days flow at Cheslatta falls >330m^3/s	Low
Minimize open-water, overbank flooding	Number of days at Vanderhoof where flow exceeds 550 m^3/s	Low
Minimize flooding of hiking trails	Number of days at Vanderhoof where flow exceeds 355 m^3/s	Low
Maximize access to boat docks and launches	Average reservoir elevation between DATE and DATE	High
Maximize RTA revenue	Average difference between reservoir inflow and outflow	High

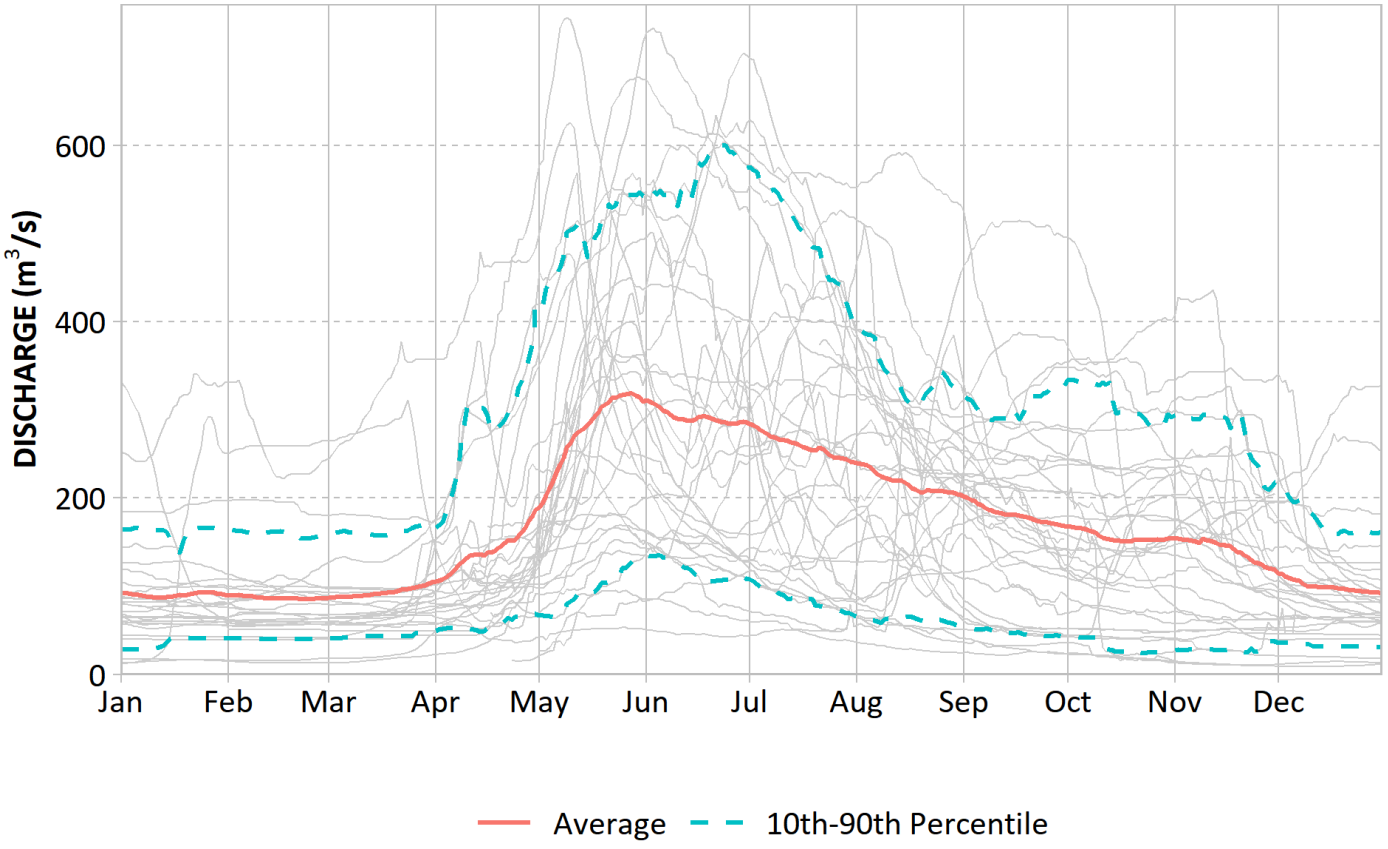
Purpose of trial alternatives

- Demonstrate how performance measures respond to flow management decisions
- Demonstrate some of the trade-offs that may be required in SDM process
- Provide a starting point to inform discussion of potential alternatives
- **Not intended as a future operational regime**

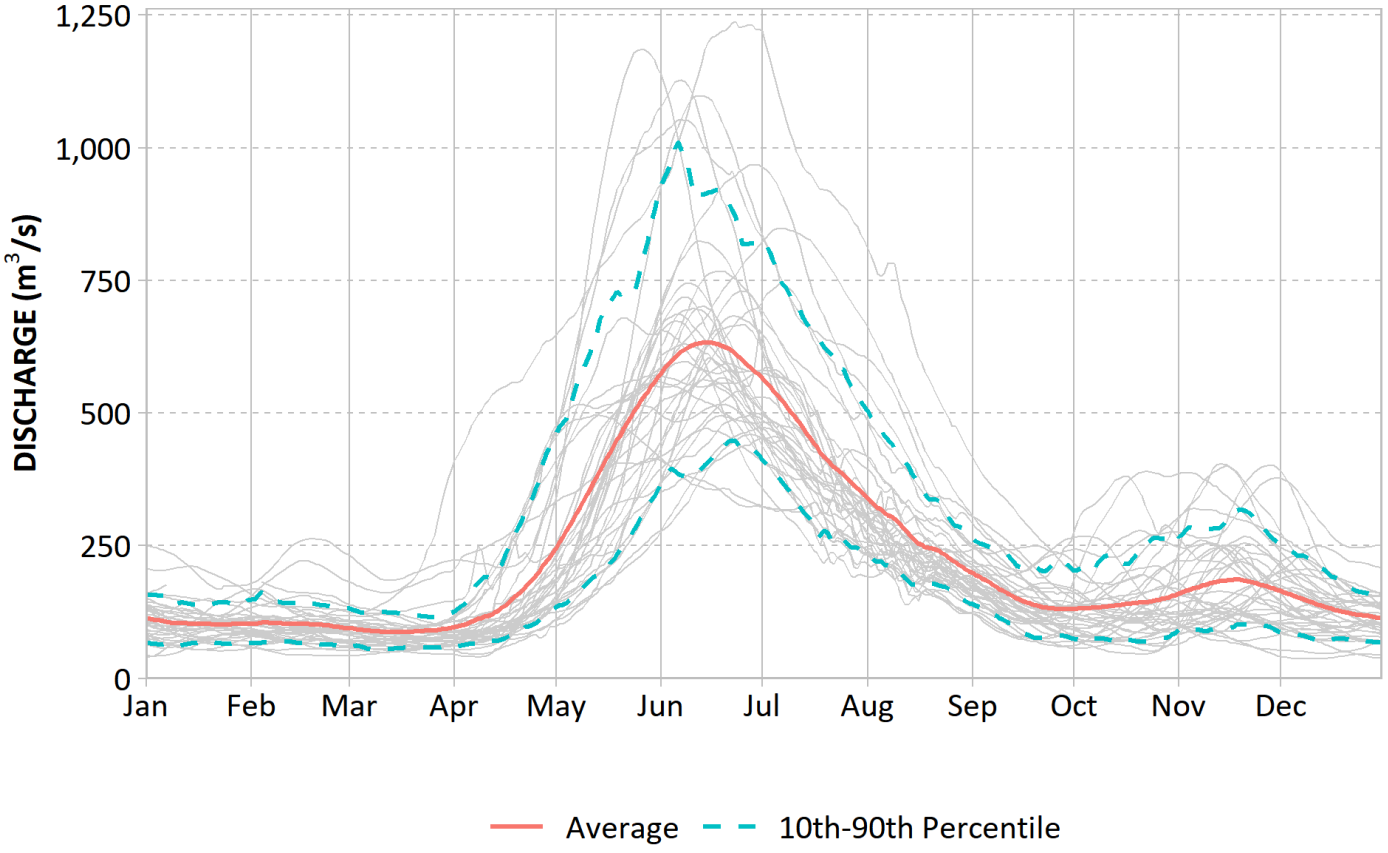
Trial Alternative #1 - Historic (1981 to 2019)



Trial Alternative #2 - Historic (1953 to 1980)



Trial Alternative #3 - Naturalized



Trial alternatives - Comparison