

Cowichan Water Use Plan Public Advisory Committee Meeting #2 Cowichan Water Management

February 1st, 2018

A community planning initiative in partnership with:



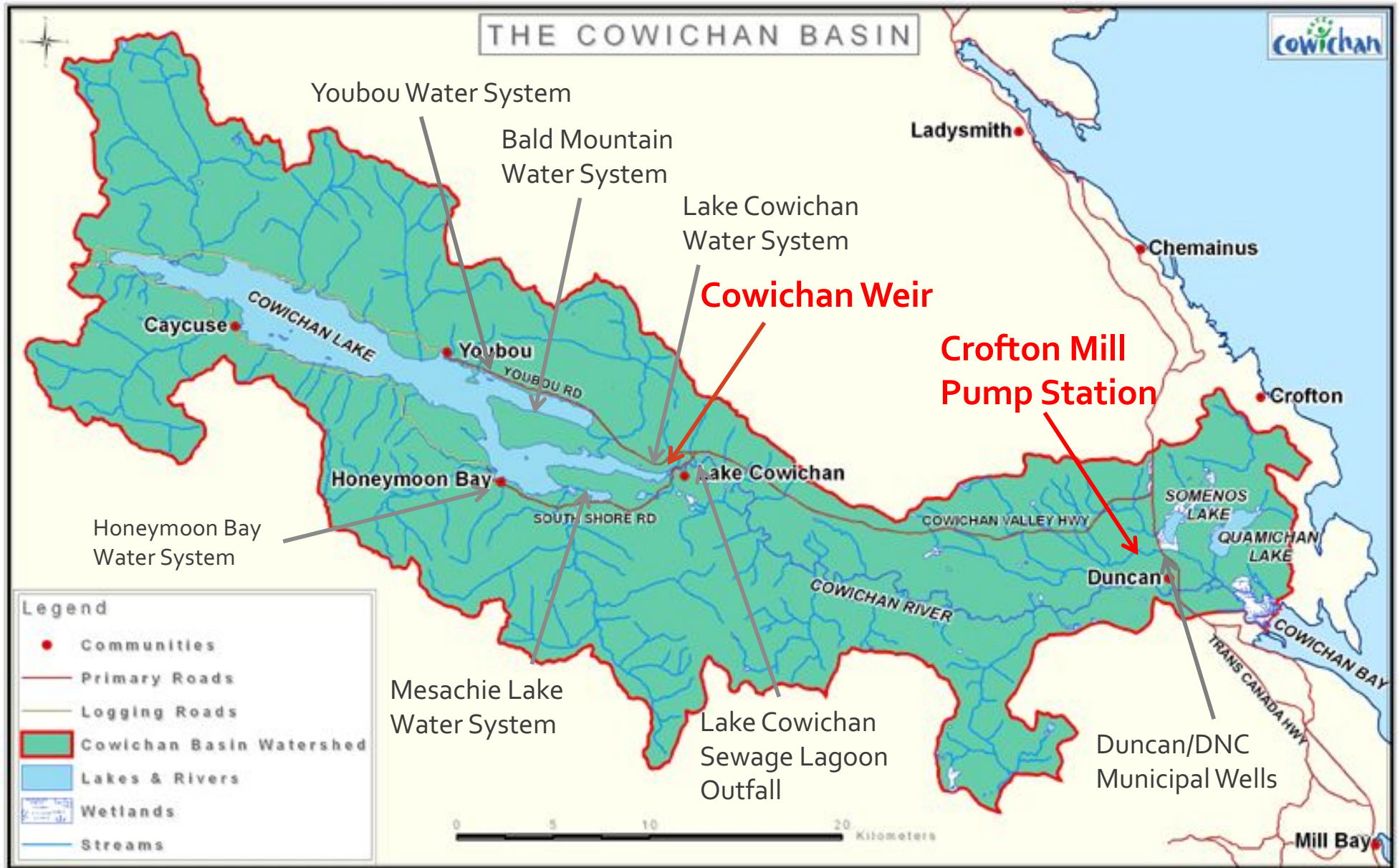
**Cowichan
Watershed
BOARD**



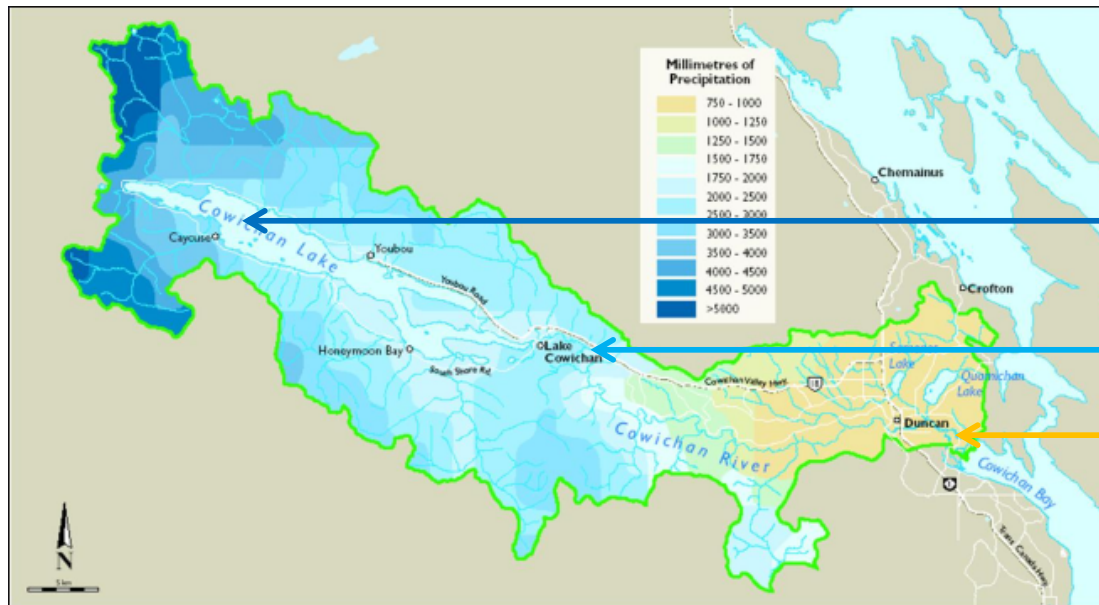


Cowichan Water Management

- Hydrology and climate change
- Water management system (weir)
- Modeling water use alternatives (methods and assumptions)



Variation in Rainfall



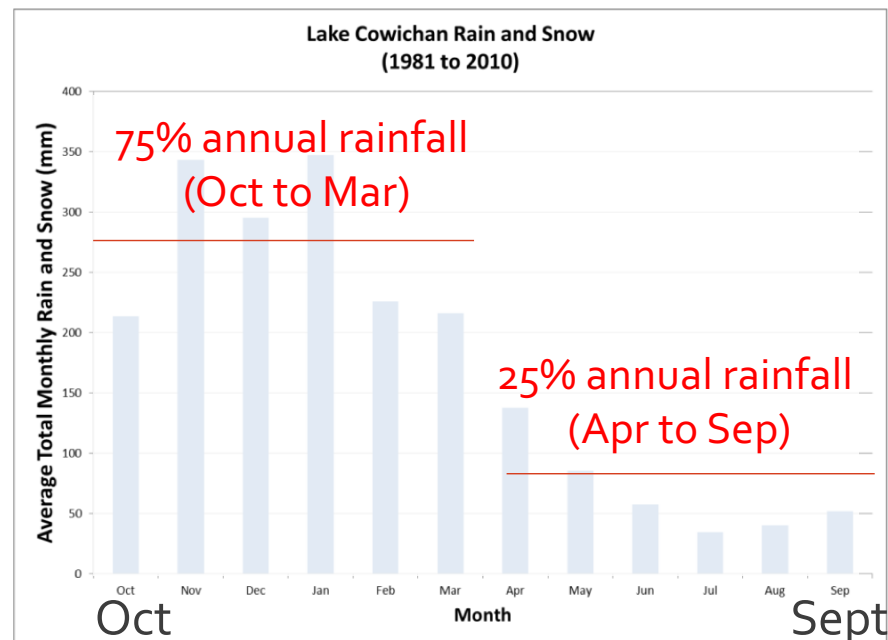
Total Annual Rainfall

Western Portion of Watershed - > 2,500 mm









Lake Cowichan – 2,050 mm

Duncan - 1,150 mm

We live in a rainforest...we have plenty of water....why are there water issues?

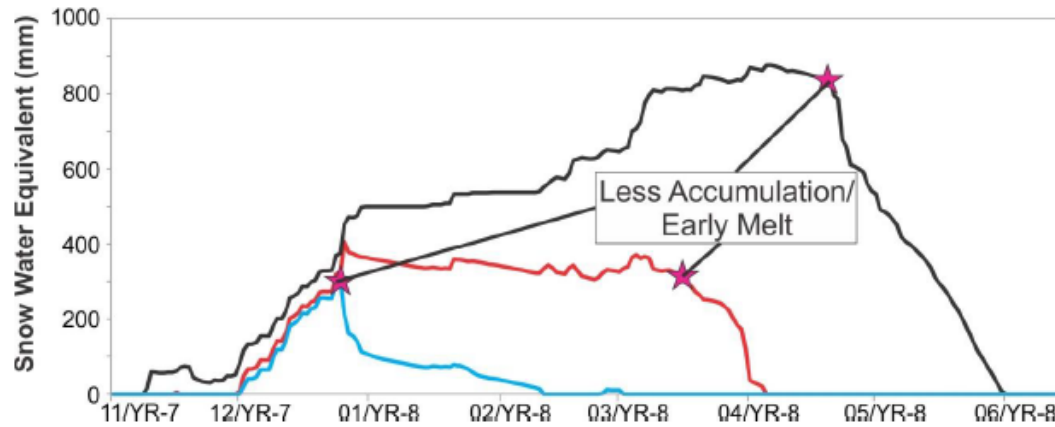


Climate Change in Cowichan

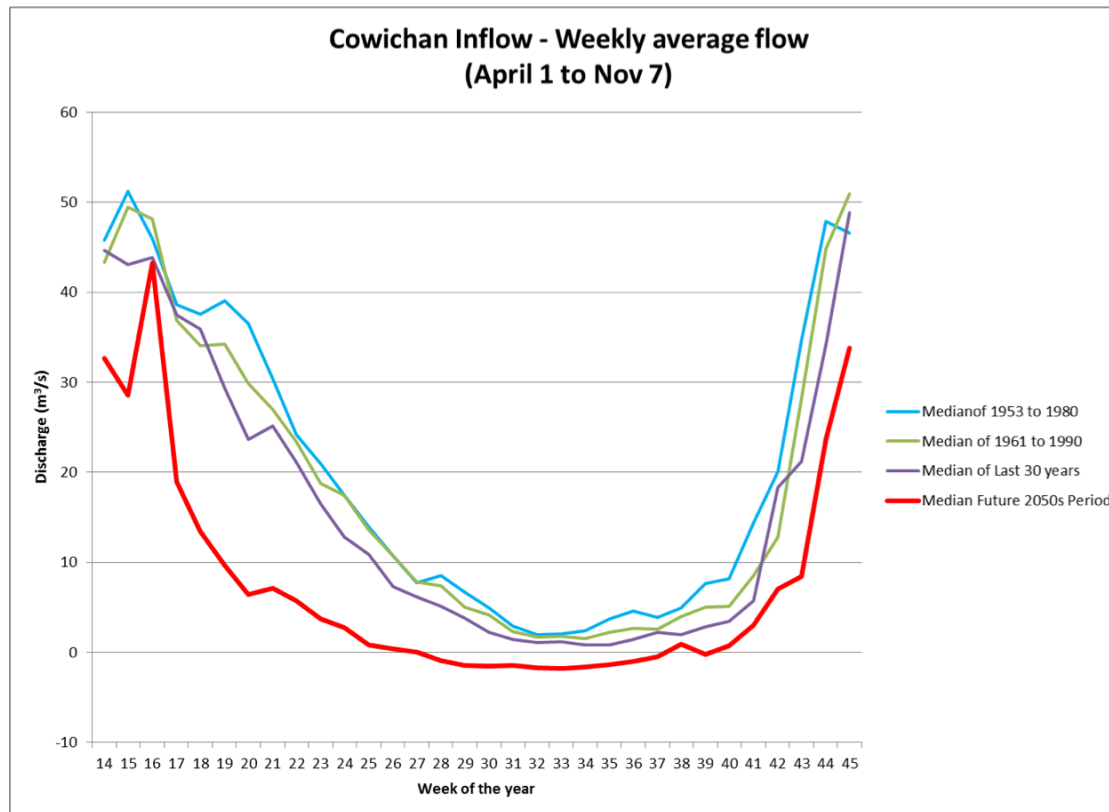
	Change by 2050	Change by 2080	Impact
Less summer rainfall	- 30 mm 	- 40 mm 	Less summer inflow to lake/river
Longer Dry Spells	From 22 days now to 26 days by 2050	From 22 days now to 32 days by 2080s	Longer period where storage required
Higher summer temp	+ 3.2 °C 	+ 5.2 °C 	Increase evaporation and increase irrigation demand
Higher winter temp	+ 2.4 °C 	+ 4.4 °C 	Less snow = less spring runoff
April 1 Snowpack	- 50% 	- 85% 	Less snow = less spring runoff

Source: Pacific Climate Impacts Consortium, 2017

Climate Change in Cowichan



Source: Foster and Allen, 2015



Cowichan Weir

Constructed in 1957 – Operated by Catalyst Paper



Stores 59.5 million m³ of water in Cowichan Lake
(equivalent to 97 cm depth of water over lake surface)
(about 97 days of supply at minimum flow)

Original design

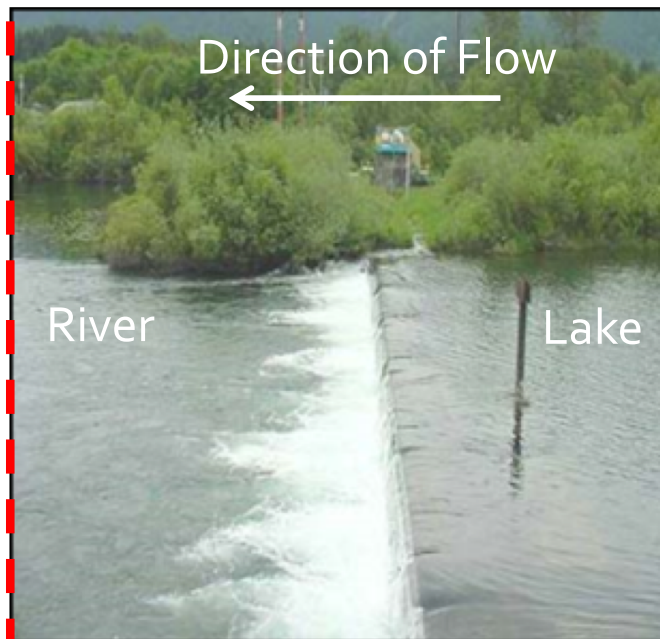
Design Intent	Water Licence Flow
Maintain min. flow in Cowichan River below weir	250 cfs (about 7 m ³ /s)
Provide water for for Crofton Mill	100 cfs (about 2.8 m ³ /s)
Maintain min. flow below the Crofton Mill Pump Station	100 cfs (about 2.8 m ³ /s)

Cowichan Weir

Operation during the Year

Weir/Gates Controlling Flow/Lake Level

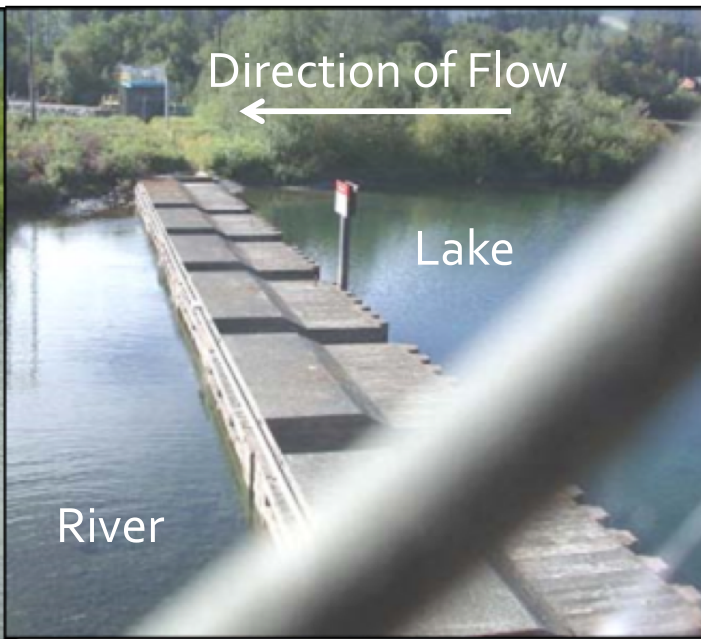
Late Spring/Early Summer
(April to July)



Gates are fully raised and
Boat lock is closed

Try to maintain Lake level
Near top of weir to
Store water for summer
(but depends on inflow)

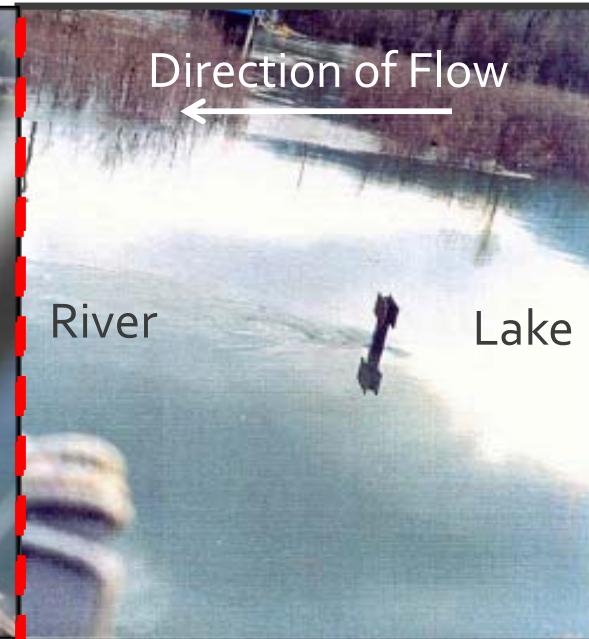
Late Summer/Early Fall
(August to October)



Gates are operated to
Maintain required minimum
Flow

Water levels drop in lake as
Water stored in spring is used to
maintain summer flows.

Weir/Gates Not Controlling Flow/ Lake Level Winter



Gates are fully lowered and
Boat lock opened

Lake levels rise above
the weir

- increased lake inflow
- flow constriction in
river channel downstream

Cowichan Weir

Hydraulics of the weir

River Flow – Channel Capacity



Wide channel
Downstream of weir

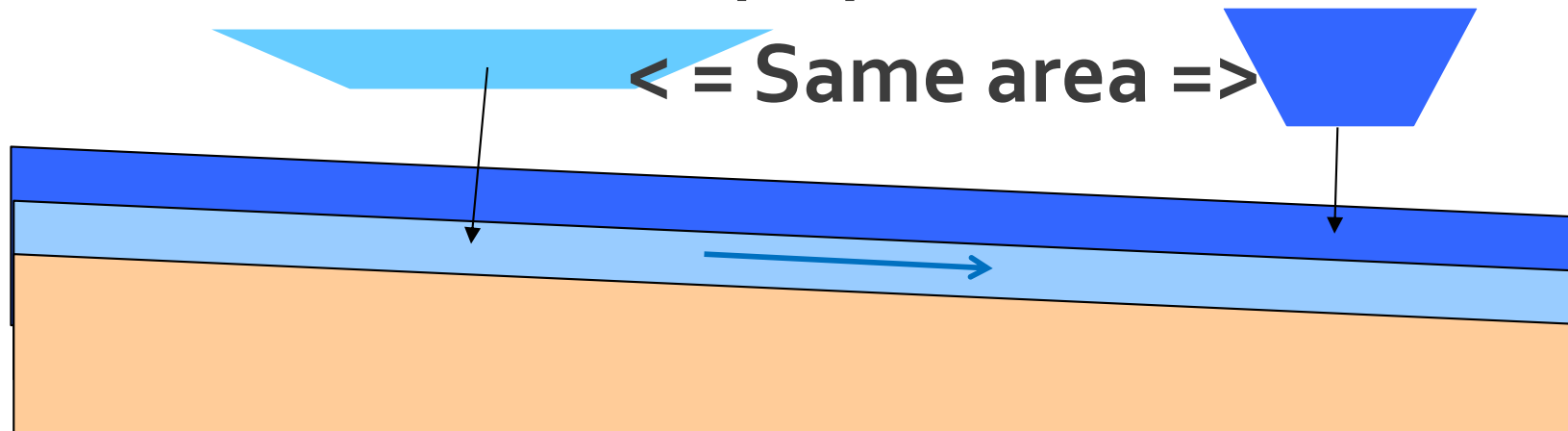


Narrow channel
at Greendale Trestle

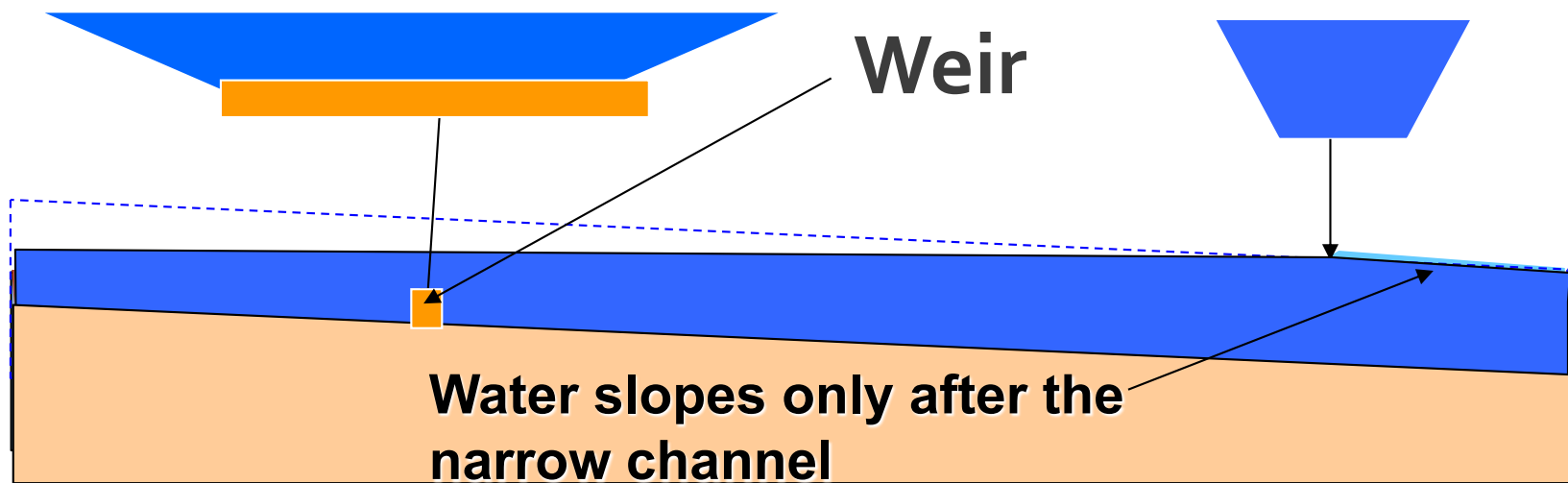
Cowichan Weir

Hydraulics of the weir

River Cross Sections = Cut perpendicular to the river



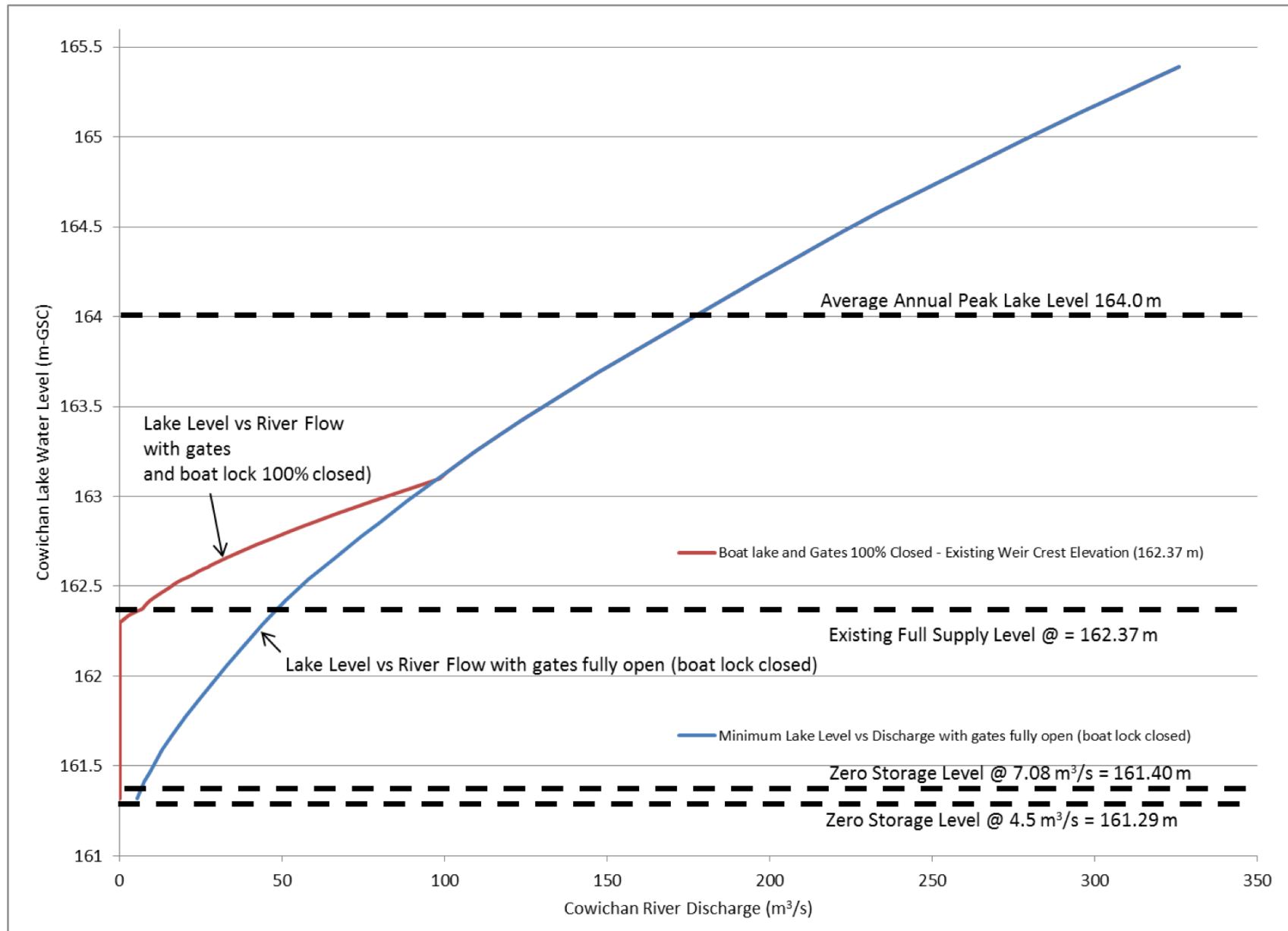
River Profile = Cut along the direction of river flow



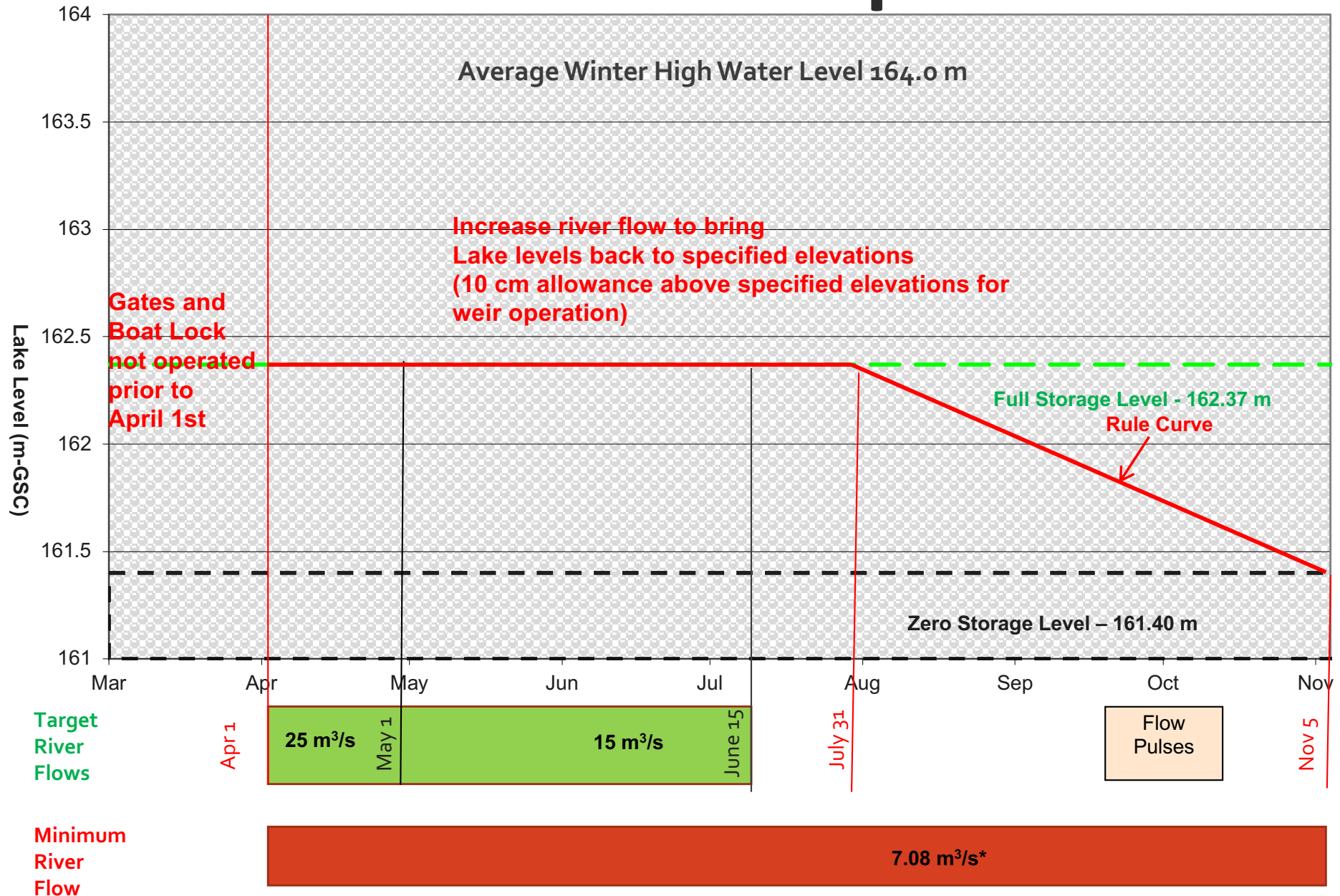
Cowichan Weir

Hydraulics of the weir

Cowichan Lake vs Cowichan River Flow Rating Curve



Cowichan Weir – Operation



Time Line March to Early November

* - 7.08 m³/s equal to 250 cfs minimum flow required by water licence

Cowichan Lake Storage Model

