Catalyts Paper
2018 - Cowichan Lake Low Flow Season Forecasting - Third Forecast
04-Sep-16

The purpose of this assessment has been to carry out forecasting of Cowichan Lake water levels and flow releases for 2018 low flow season.
This memo presents the results of the third forecast for the 2018 low flow season.

Water levels and flow releases have been forecast from Sept 4 2018 for two assumed inflow conditions, the 10th percentile inflow and 2017 inflow.

The assumed inflow conditions are outlined in Table 1. They are based on analysis of historical Cowichan Lake inflow calculated from historical discharge and water level records for the period from 1953 to 2017 (65 years).

Table 1 - Assumed low flow season (May 1 to Oct 31) Inflow Condition Comparison

Assumed Inflow Conditions	Average Cowichan Lake Net Inflow (m^3/s)
10-th Pecentile Inflow	1.60
Summer 2017 Inflow	8.88

Flow Release Option

Only one flow release option has been forecast (Option 3) for this update which assumes maintaining a release of 4.5 m^3/s until return of fall rains
The other two options previously forecast have been included in the forecast for comparison purposes including:
Option 1 - Maintaining 7 m3/s for the entire low flow season
Option 2 - Holding 5.5 m^3/s as of August 1 2018

Results

The release options have been forcast until the date forcasted releases fall below 4.5 m^3/s
Forecast water level and river flow hydrographs for the 10th percentile inflow condition and 2017 inflow conditions are shown in Figure 1 and Figure 2, respe
Projected dates for water levels to fall below the Zero Storage Levels for 7 m3/s, 5.5 m3/s and 4.5 m3/s are shown in the tables above the charts in Figure 1 a

Comment

The results indicate that since the previous update on July 24, the projected date to reach Zero Storage level for 4.5 m3/s has changed as follows.
For Inflow Condition 1 - 10th percentile inflow, the forecast date to reach the ZSL has moved forward from September 21, 2018 to Oct 1 2018
For Inflow Condition 2 - 2017 inflow, the forecat date to reach ZSL has moved back from October 30, 2018 to Oct 21, 2018
These results indicate that the current year inflow is greater than the 10th percentile condition but less than the 2017 inflow.

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Cowichan Lake 2018 Forecast

Inflow Condition 1 - 10th Percentie Inflow

		Date water level drops below ZSL for given flow			
Level		*161.4*	*161.31*	*161.29*	
		Option 1	*Option 2*	*Option 3*	
Alternative		**7 cms (161.40 m)**	**5.5 cms (161.31m)**	**4.5 cms (161.29 m)**	**Comment**
	1	Aug 24	Aug 31	Sep 02	Hold at 7.08 m3/s for remainder of dry season (For comparison purposes only)
	2	Sep 03	Sep 12	Sep 14	Hold at 5.5 m3/s for remainder of dry season
	3	Sep 16	Sep 28	Oct 01	Hold at 5.5 m^3/s until August 1 then ramp down at 0.5 m^3/s to 4.5 m^3/s and hold fo

Figure 1a - Forecast Cowichan Lake Water Levels

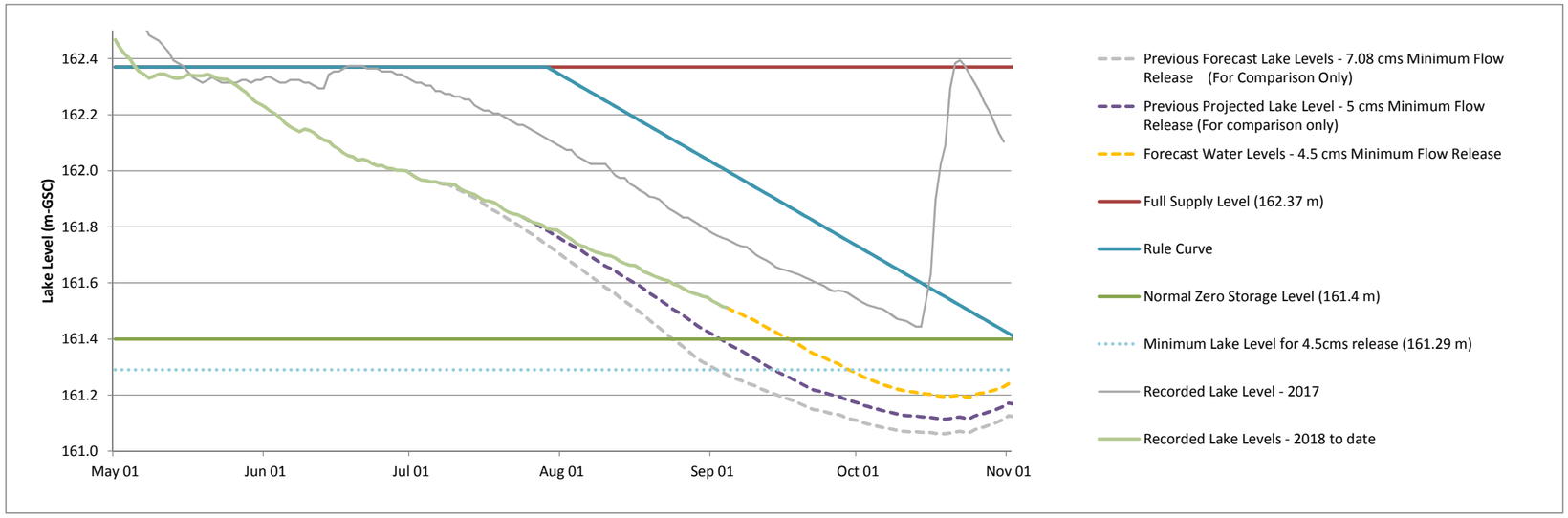
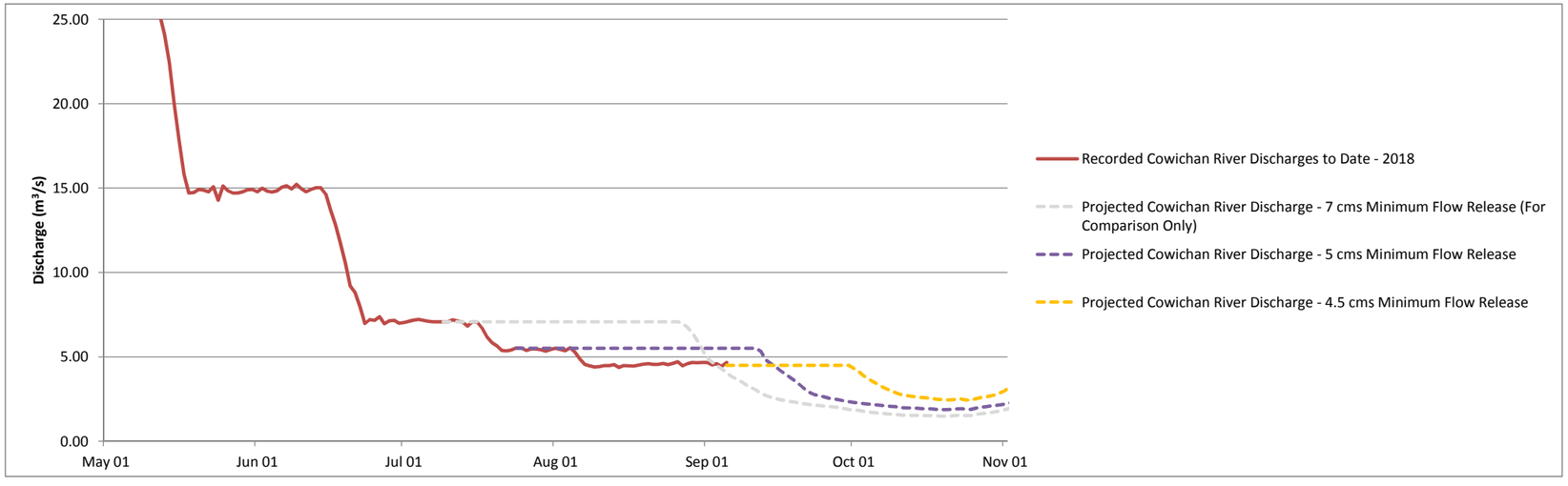


Figure 1b - Forecast Cowichan Lake Flow Releases to Cowichan River



Cowichan Lake 2018 Forecast

Inflow Condition 2 - Summer 2017 Inflow

	Date water level drops below ZSL for given flow			
Level	*161.4*	*161.31*	*161.29*	
	Option 1	*Option 2*	*Option 3*	
Option	7 m^3/s (161.40 m)	5.5 m^3/s (161.31 m)	4.5 m^3/s (161.29 m)	Comment
1	Sep 06	Sep 16	Sep 22	Hold at 7.08 m^3/s for remainder of dry season (for comparison purposes only)
2	Sep 18	Oct 04	Oct 09	Hold at 5.5 m^3/s for remainder of dry season
3	Oct 04	Oct 16	Oct 21	Hold at 5.5 m^3/s until August 1 then ramp down at 0.5 m^3/s to 4.5 m^3/s and hold for rema
	N/A - Lake level does not drop below ZSL prior to Nov 1			

Figure 2a - Forecast Cowichan Lake Water Levels

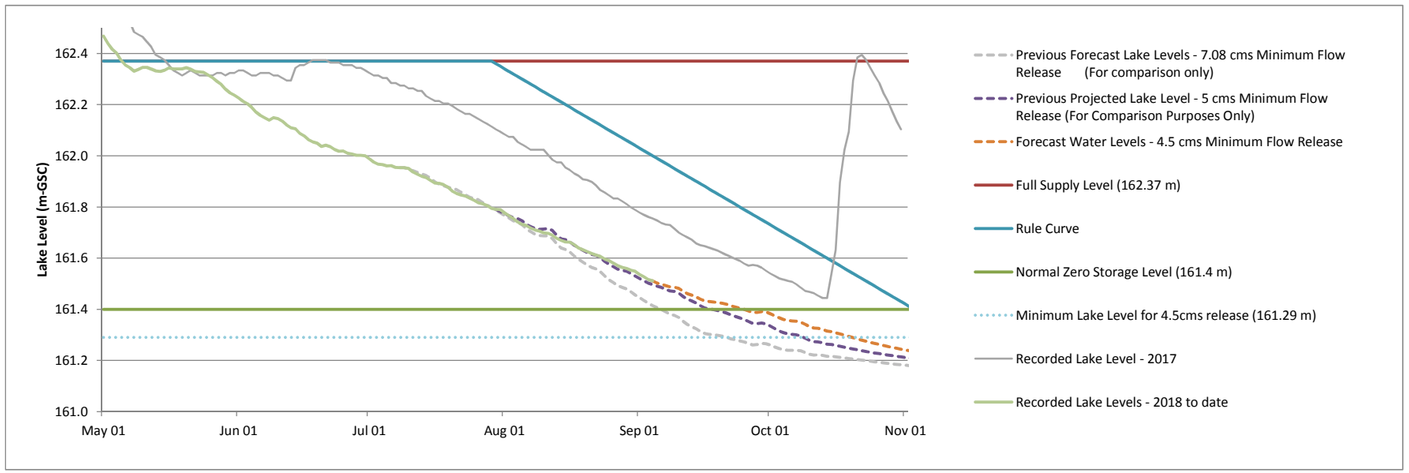


Figure 2b - Forecast Cowichan Lake Flow Releases to Cowichan River