

Site Description

Study Name	CBWQ-Upper Columbia
Site	NABIRO2
Sampling Date	Sep 20 2017
Know Your Watershed Basin	Upper Columbia
Province / Territory	British Columbia
Terrestrial Ecological Classification	Montane Cordillera EcoZone Southern Rocky Mountain Trench EcoRegion
Coordinates (decimal degrees)	51.15875 N, 116.80204 W
Altitude	2683
Local Basin Name	Birchlands Creek
	Upper Columbia
Stream Order	3



Figure 1. Location Map

- Across Reach (No image found)
- Aerial (No image found)
- Down Stream (No image found)
- Field Sheet (No image found)
- Miscellaneous (No image found)
- Substrate (No image found)
- Up Stream (No image found)

Cabin Assessment Results

		Reference Model Summary				
Model	Columbia-Okanagan Preliminary March 2010					
Analysis Date	January 30, 2018					
Taxonomic Level	Family					
Predictive Model Variables	Depth-Avg Latitude Longitude Reg-Ice Reg-SlopeLT30%					
Reference Groups	1	2	3	4	5	
Number of Reference Sites	9	43	17	12	33	
Group Error Rate	22.2%	24.5%	22.2%	25.0%	32.4%	
Overall Model Error Rate	26.4%					
Probability of Group Membership	0.2%	0.2%	16.2%	12.0%	71.3%	
CABIN Assessment of NABIRO2 on Sep 20, 2017	Similar to Reference					

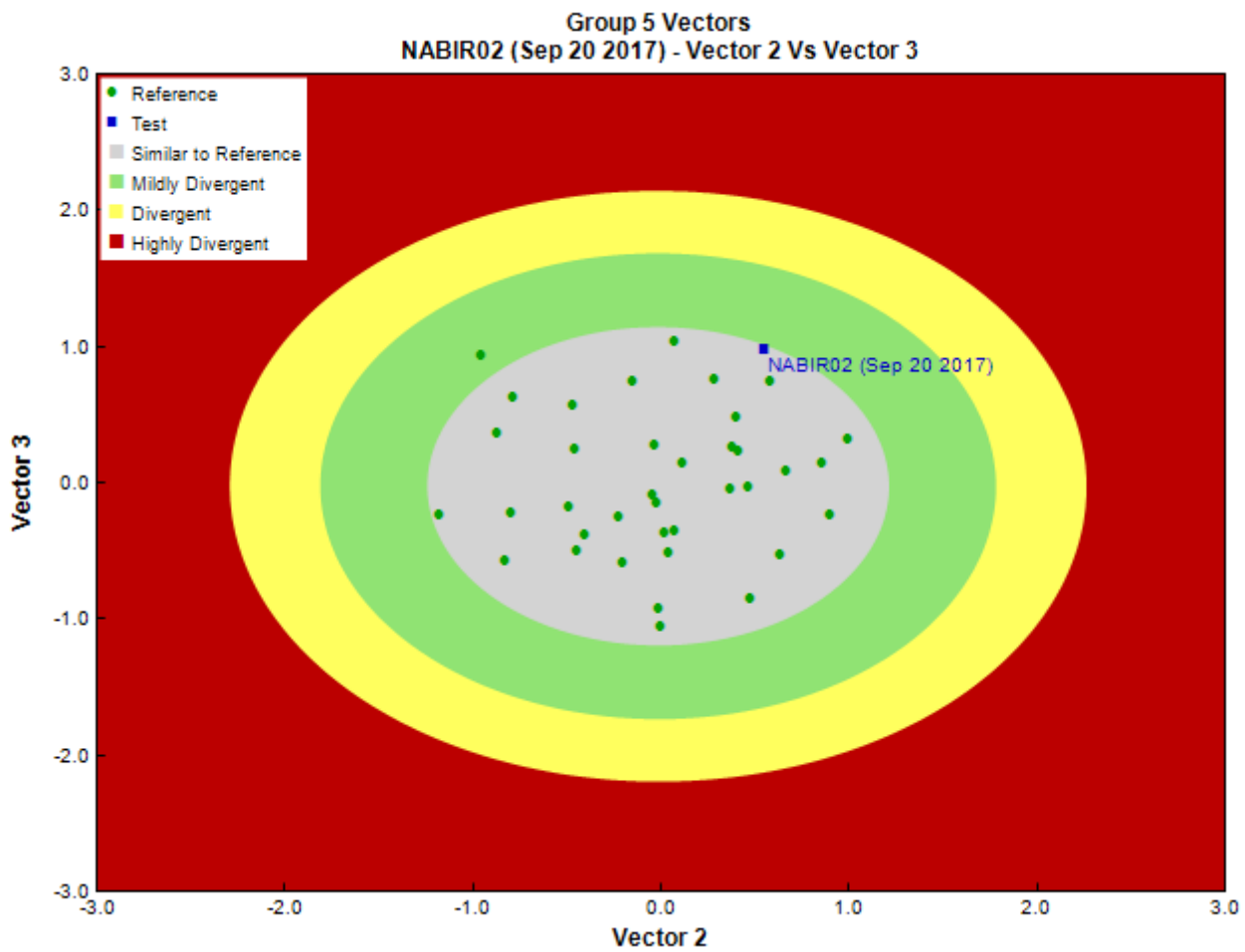


Figure 3. CABIN ordination assessment of the test site with the predicted group of reference sites. Each axis represents the relative abundance of the entire benthic invertebrate community with different organisms weighted differently on each axis.

Sample Information

Sampling Device	Kick Net
Mesh Size	400
Sampling Time	3
Taxonomist	Pina Viola, Consultant
Date Taxonomy Completed	December 17, 2017
	Marchant Box
Sub-Sample Proportion	12/100

Community Structure

Phylum	Class	Order	Family	Raw Count	Total Count		
Arthropoda	Insecta	Diptera	Chironomidae	20	166.7		
			Empididae	11	91.7		
			Psychodidae	1	8.3		
					Tipulidae	1	8.3
			Ephemeroptera	Ameletidae	2	16.7	
				Baetidae	8	66.6	
				Ephemerellidae	1	8.3	
				Heptageniidae	21	175.0	
			Plecoptera		2	16.7	
				Capniidae	7	58.3	
				Chloroperlidae	6	50.0	
				Nemouridae	52	433.3	
				Perlodidae	2	16.7	
				Taeniopterygidae	222	1,850.0	
				Trichoptera	Hydropsychidae	1	8.3

Community Structure

Phylum	Class	Order	Family	Raw Count	Total Count
			Total	357	2,974.9

Metrics

Name	NABIR02	Predicted Group Reference Mean \pm SD
Bray-Curtis Distance	0.57	0.4 \pm 0.1
Biotic Indices		
Hilsenhoff Family index (North-West)	2.5	2.8 \pm 0.3
Intolerant taxa	--	1.0 \pm 0.0
Long-lived taxa	--	1.0 \pm 0.0
Tolerant individuals (%)	--	0.3
Functional Measures		
% Filterers	0.3	1.7 \pm 1.7
% Gatherers	85.4	50.6 \pm 14.6
% Predatores	11.2	15.3 \pm 9.0
% Scrapers	72.0	67.2 \pm 16.8
% Shredder	79.0	38.1 \pm 18.2
No. Clinger Taxa	14.0	19.8 \pm 3.4
Number Of Individuals		
% Chironomidae	5.6	4.6 \pm 5.0
% Coleoptera	0.0	0.0 \pm 0.0
% Diptera + Non-insects	9.3	6.3 \pm 5.3
% Ephemeroptera	9.0	44.9 \pm 17.3
% Ephemeroptera that are Baetidae	25.0	26.1 \pm 20.5
% EPT Individuals	90.7	93.7 \pm 5.3
% Odonata	0.0	0.0 \pm 0.0
% of 2 dominant taxa	77.2	60.2 \pm 11.4
% of 5 dominant taxa	91.8	84.5 \pm 5.9
% of dominant taxa	62.5	39.3 \pm 12.3
% Plecoptera	81.4	42.9 \pm 17.2
% Tribe Tanyatarisini	--	
% Trichoptera that are Hydropsychida	100.0	27.4 \pm 27.1
% Tricoptera	0.3	5.8 \pm 5.7
No. EPT individuals/Chironomids+EPT Individuals	0.9	1.0 \pm 0.1
Total Abundance	2975.0	2163.6 \pm 1274.4
Richness		
Chironomidae taxa (genus level only)	1.0	0.9 \pm 0.2
Coleoptera taxa	0.0	0.1 \pm 0.2
Diptera taxa	4.0	2.4 \pm 1.0
Ephemeroptera taxa	4.0	3.7 \pm 0.5
EPT Individuals (Sum)	2683.3	2023.9 \pm 1195.7
EPT taxa (no)	10.0	12.3 \pm 1.9
Odonata taxa	0.0	0.0 \pm 0.0
Pielou's Evenness	0.5	0.7 \pm 0.1
Plecoptera taxa	5.0	5.5 \pm 1.1
Shannon-Wiener Diversity	1.4	1.9 \pm 0.3
Simpson's Diversity	0.6	0.8 \pm 0.1
Simpson's Evenness	0.2	0.3 \pm 0.1
Total No. of Taxa	14.0	16.0 \pm 3.0
Trichoptera taxa	1.0	3.2 \pm 1.0

Frequency and Probability of Taxa Occurrence

Reference Model Taxa	Frequency of Occurrence in Reference Sites					Probability Of Occurrence at NABIR02
	Group 1	Group 2	Group 3	Group 4	Group 5	
Baetidae	100%	100%	100%	100%	97%	0.98
Chironomidae	100%	100%	100%	100%	95%	0.96
Chloroperlidae	78%	88%	94%	100%	100%	0.99
Ephemerellidae	78%	100%	100%	100%	100%	1.00
Heptageniidae	100%	100%	100%	100%	100%	1.00
Hydropsychidae	11%	92%	78%	92%	86%	0.86
Nemouridae	100%	100%	100%	100%	100%	1.00

Frequency and Probability of Taxa Occurrence

Reference Model Taxa	Frequency of Occurrence in Reference Sites					Probability Of Occurrence at NABIR02
	Group 1	Group 2	Group 3	Group 4	Group 5	
Perlodidae	78%	78%	89%	92%	81%	0.84
Rhyacophilidae	100%	92%	100%	100%	95%	0.96
Taeniopterygidae	89%	49%	100%	92%	97%	0.97

RIVPACS Ratios

RIVPACS : Expected taxa P>0.50	12.53
RIVPACS : Observed taxa P>0.50	12.00
RIVPACS : O:E (p > 0.5)	0.96
RIVPACS : Expected taxa P>0.70	9.55
RIVPACS : Observed taxa P>0.70	9.00
RIVPACS : O:E (p > 0.7)	0.94

Habitat Description

Variable	NABIR02	Predicted Group Reference Mean \pm SD
Channel		
Depth-Avg (cm)	15.0	21.5 \pm 9.7
Depth-BankfullMinusWetted (cm)	37.00	38.14 \pm 36.11
Depth-Max (cm)	18.5	31.0 \pm 16.5
Macrophyte (PercentRange)	0	0 \pm 0
Reach-%CanopyCoverage (PercentRange)	2.00	1.54 \pm 1.28
Reach-DomStreamsideVeg (Category(1-4))	3	3 \pm 1
Reach-Pools (Binary)	1	1 \pm 0
Reach-Riffles (Binary)	1	1 \pm 0
Reach-StraightRun (Binary)	1	0 \pm 1
Slope (m/m)	0.0380000	0.0581357 \pm 0.0554952
Veg-Coniferous (Binary)	1	1 \pm 0
Veg-Deciduous (Binary)	1	1 \pm 0
Veg-GrassesFerns (Binary)	1	1 \pm 0
Veg-Shrubs (Binary)	1	1 \pm 0
Velocity-Avg (m/s)	0.38	0.51 \pm 0.27
Velocity-Max (m/s)	0.54	0.78 \pm 0.40
Width-Bankfull (m)	14.3	13.7 \pm 16.4
Width-Wetted (m)	2.9	9.0 \pm 13.1
XSEC-VelMethod (Category(1-3))	1	2 \pm 1
Landcover		
Reg-Ice (%)	0.00000	3.06094 \pm 5.65390
Substrate Data		
%Bedrock (%)	0	1 \pm 1
%Boulder (%)	0	3 \pm 3
%Cobble (%)	58	64 \pm 17
%Gravel (%)	2	2 \pm 2
%Pebble (%)	40	31 \pm 16
%Sand (%)	0	0 \pm 0
%Silt+Clay (%)	0	0 \pm 0
D50 (cm)	7.00	19.61 \pm 30.65
Dg (cm)	6.7	20.3 \pm 30.8
Dominant-1st (Category(0-9))	6	7 \pm 1
Dominant-2nd (Category(0-9))	5	6 \pm 1
Embeddedness (Category(1-5))	4	4 \pm 1
PeriphytonCoverage (Category(1-5))	1	2 \pm 1
SurroundingMaterial (Category(0-9))	3	3 \pm 1
Topography		
Reg-SlopeLT30% (%)	21.53000	16.26604 \pm 8.50298
Water Chemistry		
Ag (mg/L)	0.0100000	0.0000025 \pm 0.0000029
Al (mg/L)	13.2000000	0.0068250 \pm 0.0065408
As (mg/L)	0.0500000	0.0007150 \pm 0.0011508
B (mg/L)	25.0000000	0.0333333 \pm 0.0288675
Ba (mg/L)	155.0000000	0.1105900 \pm 0.0816788

Habitat Description

Variable	NABIR02	Predicted Group Reference Mean \pm SD
Be (mg/L)	0.0500000	0.0000050 \pm 0.0000058
Bi (mg/L)	0.5000000	0.0000025 \pm 0.0000029
Ca (mg/L)	46.0000000	23.0705882 \pm 17.1292507
Cd (mg/L)	0.0050000	0.0000025 \pm 0.0000029
Chloride-Dissolved (mg/L)	1.3000000	0.4147059 \pm 0.6325189
Co (mg/L)	0.1000000	0.0000108 \pm 0.0000045
CO3 (mg/L)	4.5000000	0.0000000 \pm 0.0000000
Cr (mg/L)	0.5000000	0.0000500 \pm 0.0000577
Cu (mg/L)	0.2500000	0.0003225 \pm 0.0003721
Fe (mg/L)	24.0000000	0.0050000 \pm 0.0028284
General-Alkalinity (mg/L)	176.0000000	68.5944444 \pm 52.1098452
General-Conductivity (μ S/cm)	241.1000000	110.5428571 \pm 89.3409737
General-DO (mg/L)	8.0000000	11.0635135 \pm 0.9899052
General-Hardness (mg/L)	202.0000000	88.7500000 \pm 65.9614844
General-pH (pH)	9.0	7.7 \pm 0.7
General-TempAir (Degrees Celsius)	7.0	10.5 \pm 0.7
General-TempWater (Degrees Celsius)	6.9000000	5.5262162 \pm 1.8860693
General-Turbidity (NTU)	4.1400000	0.1015000 \pm 0.0459619
HCO3 (mg/L)	206.0000000	0.0000000 \pm 0.0000000
Hg (ng/L)	5.0000000	0.0000000 \pm 0.0000000
K (mg/L)	0.5660000	0.3252941 \pm 0.2988993
Li (mg/L)	1.0000000	0.0009650 \pm 0.0007595
Mg (mg/L)	21.2000000	7.6670588 \pm 6.3323257
Mn (mg/L)	1.5000000	0.0003198 \pm 0.0001463
Mo (mg/L)	2.3000000	0.0006200 \pm 0.0004410
Na (mg/L)	0.7910000	0.8885294 \pm 0.7285025
Ni (mg/L)	0.5000000	0.0001300 \pm 0.0001937
Nitrogen-NH3 (mg/L)	0.0100000	0.0119375 \pm 0.0293336
Nitrogen-NO2 (mg/L)	0.0025000	0.0074306 \pm 0.0217095
Nitrogen-NO2+NO3 (mg/L)	0.0880000	0.0315000 \pm 0.0316491
Nitrogen-NO3 (mg/L)	0.0880000	0.0699722 \pm 0.0547511
Pb (mg/L)	0.1000000	0.0000215 \pm 0.0000198
Phosphorus-OrthoP (mg/L)	0.0025000	0.0008750 \pm 0.0012583
Phosphorus-TP (mg/L)	2.0000000	0.0025000 \pm 0.0041986
S (mg/L)	8.7000000	11.5000000 \pm 12.0208153
Sb (mg/L)	0.2500000	0.0000270 \pm 0.0000061
Se (mg/L)	0.0500000	0.0000450 \pm 0.0000614
Si (mg/L)	2580.0000000	1.8247059 \pm 0.6920511
Sn (mg/L)	2.5000000	0.0000050 \pm 0.0000058
Sr (mg/L)	71.7000000	0.0823000 \pm 0.1023104
Ti (mg/L)	2.5000000	0.0005000 \pm 0.0000000
Tl (mg/L)	0.0050000	0.0000020 \pm 0.0000028
U (mg/L)	1.1700000	0.0004868 \pm 0.0003873
V (mg/L)	2.5000000	0.0002425 \pm 0.0003161
Zn (mg/L)	2.5000000	0.0005500 \pm 0.0006403
Zr (mg/L)	0.0500000	0.0000000 \pm 0.0000000