

**Site Description**

<b>Study Name</b>	CBWQ-Arrow
<b>Site</b>	NEMCD01
<b>Sampling Date</b>	Sep 28 2016
<b>Know Your Watershed Basin</b>	Central Columbia
<b>Province / Territory</b>	British Columbia
<b>Terrestrial Ecological Classification</b>	Montane Cordillera EcoZone Columbia Mountains and Highlands EcoRegion
<b>Coordinates (decimal degrees)</b>	50.14500 N, 117.79389 W
<b>Altitude</b>	1545
<b>Local Basin Name</b>	McDonald Ck.
	Columbia River
<b>Stream Order</b>	4



Figure 1. Location Map



Across Reach



Down Stream

A photograph of a field sheet with handwritten data. A blue pen is resting on the sheet. The sheet contains a table with water quality data and a section for weather and comments.

CBWQMP 2016 Field Form:  
Conductivity, Turbidity, Temperature, pH, DO

Site Code: NEWDOI Stream Name: McDONALD Date: 08/26/16 Time: \_\_\_\_\_ Zone: \_\_\_\_\_  
HW: 1407552016

Field Crew: IAN GREY, SIMON WALLIS, TARA HARRISON

Dissolved Oxygen In-situ	<u>10</u>	mg/L	Specific Conductance YSI 30	<u>296.1</u>	µS
pH	<u>7.59</u>		Turbidity Hach 21000-01	<u>0.30-0.47.41</u>	NTU
Water Temperature	<u>8.8</u>	°C	Air Temperature	<u>11</u>	°C

Weather:  
Comments:  
Stream Profile and Velocity Measurement:

Field Sheet

Miscellaneous (No image found)



Substrate



Up Stream

### Cabin Assessment Results

Reference Model Summary					
<b>Model</b>	Columbia-Okanagan Preliminary March 2010				
<b>Analysis Date</b>	February 27, 2017				
<b>Taxonomic Level</b>	Family				
<b>Predictive Model Variables</b>	Depth-Avg Latitude Longitude Reg-Ice Reg-SlopeLT30%				
<b>Reference Groups</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Number of Reference Sites</b>	9	43	17	12	33
<b>Group Error Rate</b>	22.2%	24.5%	22.2%	25.0%	32.4%
<b>Overall Model Error Rate</b>	26.4%				
<b>Probability of Group Membership</b>	0.1%	5.3%	8.1%	61.6%	24.8%
<b>CABIN Assessment of NEMCD01 on Sep 28, 2016</b>	Mildly Divergent				

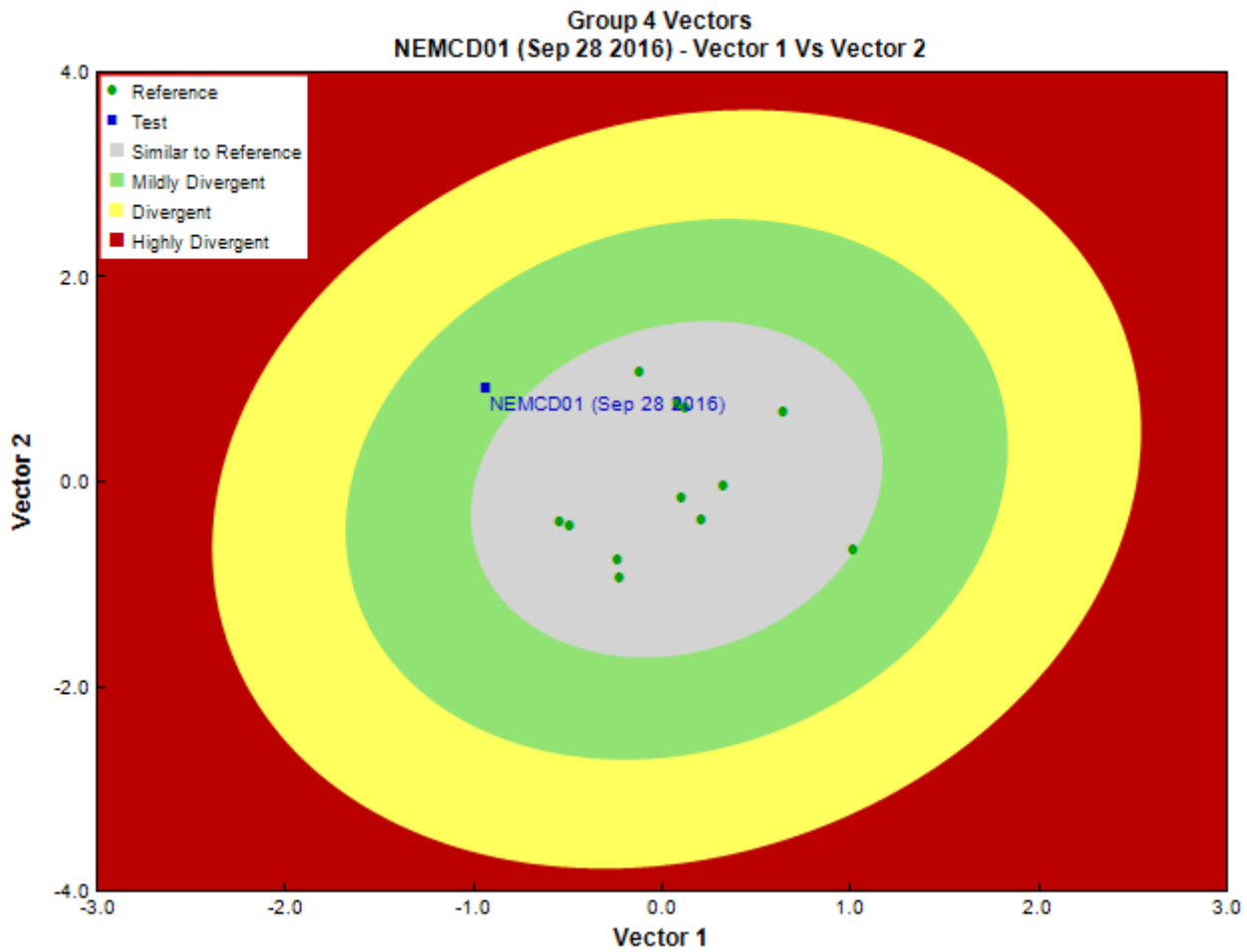


Figure 3. CABIN ordination assessment of the test site with the predicted group of reference sites. Each axis represents the relative abundance of the entire benthic invertebrate community with different organisms weighted differently on each axis.

**Sample Information**

<b>Sampling Device</b>	Kick Net
<b>Mesh Size</b>	400
<b>Sampling Time</b>	3
<b>Taxonomist</b>	Pina Viola, Consultant
<b>Date Taxonomy Completed</b>	October 27, 2016
	Marchant Box
<b>Sub-Sample Proportion</b>	18/100

**Community Structure**

Phylum	Class	Order	Family	Raw Count	Total Count	
Arthropoda	Arachnida	Sarcoptiformes		1	5.6	
		Trombidiformes		1	5.6	
				Lebertiidae	2	11.1
				Torrenticolidae	4	22.2
	Insecta	Coleoptera		Elmidae	33	183.3
			Diptera	Ceratopogonidae	1	5.6
				Chironomidae	7	38.9
				Empididae	18	100.0
				Pelecorhynchidae	1	5.6
				Psychodidae	47	261.1
				Tipulidae	4	22.3
			Ephemeroptera	Baetidae	72	400.0
				Ephemerellidae	8	44.5
				Heptageniidae	18	100.0
			Plecoptera	Chloroperlidae	9	50.0

## Community Structure

Phylum	Class	Order	Family	Raw Count	Total Count
			Leuctridae	3	16.7
			Nemouridae	11	61.2
			Perlidae	1	5.6
			Perlodidae	10	55.6
			Taeniopterygidae	12	66.7
		Trichoptera	Brachycentridae	4	22.2
			Glossosomatidae	43	238.9
			Hydropsychidae	2	11.1
			Rhyacophilidae	14	77.8
			Uenoidae	7	38.9
			Total	333	1,850.5

## Metrics

Name	NEMCD01	Predicted Group Reference Mean $\pm$ SD
Bray-Curtis Distance	0.63	0.4 $\pm$ 0.1
<b>Biotic Indices</b>		
Hilsenhoff Family index (North-West)	3.8	3.2 $\pm$ 0.3
Intolerant taxa	--	
Long-lived taxa	4.0	2.1 $\pm$ 1.0
Tolerant individuals (%)	--	0.8 $\pm$ 0.3
<b>Functional Measures</b>		
% Filterers	1.8	2.2 $\pm$ 1.8
% Gatherers	42.9	38.4 $\pm$ 12.4
% Predatores	20.7	19.0 $\pm$ 8.5
% Scrapers	58.6	63.2 $\pm$ 19.7
% Shredder	20.1	27.6 $\pm$ 15.2
No. Clinger Taxa	24.0	23.2 $\pm$ 6.3
<b>Number Of Individuals</b>		
% Chironomidae	2.1	7.4 $\pm$ 6.4
% Coleoptera	10.0	1.5 $\pm$ 3.9
% Diptera + Non-insects	25.4	10.8 $\pm$ 7.6
% Ephemeroptera	29.6	51.7 $\pm$ 18.8
% Ephemeroptera that are Baetidae	73.5	40.6 $\pm$ 30.0
% EPT Individuals	64.7	87.7 $\pm$ 7.4
% Odonata	0.0	0.0 $\pm$ 0.0
% of 2 dominant taxa	36.0	57.9 $\pm$ 14.2
% of 5 dominant taxa	64.4	81.6 $\pm$ 7.9
% of dominant taxa	21.8	39.8 $\pm$ 14.9
% Plecoptera	13.9	31.4 $\pm$ 15.4
% Tribe Tanyatarisini	--	
% Trichoptera that are Hydropsychida	2.9	27.0 $\pm$ 26.2
% Tricoptera	21.1	4.5 $\pm$ 2.8
No. EPT individuals/Chironomids+EPT Individuals	1.0	0.9 $\pm$ 0.1
Total Abundance	1850.0	587.4 $\pm$ 299.1
<b>Richness</b>		
Chironomidae taxa (genus level only)	1.0	1.0 $\pm$ 0.0
Coleoptera taxa	1.0	0.4 $\pm$ 0.5
Diptera taxa	6.0	3.3 $\pm$ 1.0
Ephemeroptera taxa	3.0	3.8 $\pm$ 0.8
EPT Individuals (Sum)	1188.9	526.0 $\pm$ 285.8
EPT taxa (no)	14.0	13.3 $\pm$ 2.7
Odonata taxa	0.0	0.0 $\pm$ 0.0
Pielou's Evenness	0.8	0.7 $\pm$ 0.1
Plecoptera taxa	6.0	6.3 $\pm$ 1.1
Shannon-Wiener Diversity	2.6	1.9 $\pm$ 0.4
Simpson's Diversity	0.9	0.8 $\pm$ 0.1
Simpson's Evenness	0.4	0.3 $\pm$ 0.1
Total No. of Taxa	23.0	19.3 $\pm$ 3.7
Trichoptera taxa	5.0	3.2 $\pm$ 1.4

### Frequency and Probability of Taxa Occurrence

Reference Model Taxa	Frequency of Occurrence in Reference Sites					Probability Of Occurrence at NEMCD01
	Group 1	Group 2	Group 3	Group 4	Group 5	
Baetidae	100%	100%	100%	100%	97%	0.99
Capniidae	78%	55%	50%	92%	68%	0.80
Chironomidae	100%	100%	100%	100%	95%	0.99
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%	0.89
Nemouridae	100%	100%	100%	100%	100%	1.00
Perlodidae	78%	78%	89%	92%	81%	0.88
Rhyacophilidae	100%	92%	100%	100%	95%	0.98
Taeniopterygidae	89%	49%	100%	92%	97%	0.91

### RIVPACS Ratios

RIVPACS : Expected taxa P>0.50	13.46
RIVPACS : Observed taxa P>0.50	14.00
RIVPACS : O:E (p > 0.5)	1.04
RIVPACS : Expected taxa P>0.70	10.44
RIVPACS : Observed taxa P>0.70	10.00
RIVPACS : O:E (p > 0.7)	0.96

### Habitat Description

Variable	NEMCD01	Predicted Group Reference Mean $\pm$ SD
<b>Channel</b>		
Depth-Avg (cm)	17.1	23.6 $\pm$ 11.1
Depth-BankfullMinusWetted (cm)	15.60	51.38 $\pm$ 29.42
Depth-Max (cm)	27.0	34.6 $\pm$ 12.3
Macrophyte (PercentRange)	0	0 $\pm$ 0
Reach-%CanopyCoverage (PercentRange)	2.00	1.33 $\pm$ 0.78
Reach-DomStreamsideVeg (Category (1-4))	3	4 $\pm$ 1
Reach-Pools (Binary)	1	1 $\pm$ 0
Reach-Riffles (Binary)	1	1 $\pm$ 0
Slope (m/m)	0.0233600	0.0546683 $\pm$ 0.0376269
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)	0.77	0.48 $\pm$ 0.22
Velocity-Max (m/s)	1.17	0.76 $\pm$ 0.36
Width-Bankfull (m)	7.1	13.4 $\pm$ 9.9
Width-Wetted (m)	5.1	8.5 $\pm$ 5.8
XSEC-VelMethod (Category (1-3))	1	1 $\pm$ 0
<b>Landcover</b>		
Reg-Ice (%)	0.00000	0.02487 $\pm$ 0.06034
<b>Substrate Data</b>		
%Bedrock (%)	0	0 $\pm$ 0
%Boulder (%)	2	9 $\pm$ 9
%Cobble (%)	35	51 $\pm$ 15
%Gravel (%)	7	3 $\pm$ 3
%Pebble (%)	56	37 $\pm$ 20
%Sand (%)	0	0 $\pm$ 0
%Silt+Clay (%)	0	0 $\pm$ 0
D50 (cm)	5.00	15.12 $\pm$ 14.26
Dg (cm)	4.8	8.2 $\pm$ 2.8
Dominant-1st (Category(0-9))	5	7 $\pm$ 1
Dominant-2nd (Category(0-9))	6	7 $\pm$ 1
Embeddedness (Category(1-5))	5	5 $\pm$ 1
PeriphytonCoverage (Category(1-5))	2	1 $\pm$ 0
SurroundingMaterial (Category(0-9))	5	4 $\pm$ 1
<b>Topography</b>		

## Habitat Description

Variable	NEMCD01	Predicted Group Reference Mean $\pm$ SD
Reg-SlopeLT30% (%)	17.35368	18.88386 $\pm$ 9.29866
<b>Water Chemistry</b>		
Chloride-Dissolved (mg/L)	0.500000	0.975000 $\pm$ 2.6309780
CO3 (mg/L)	0.250000	0.000000 $\pm$ 0.0000000
General-Alkalinity (mg/L)	129.000000	71.700000 $\pm$ 53.9231440
General-Conductivity ( $\mu$ S/cm)	289.000000	121.8083333 $\pm$ 87.6800844
General-DO (mg/L)	10.000000	11.4175000 $\pm$ 0.7986708
General-pH (pH)	7.6	7.9 $\pm$ 0.4
General-SolidsTSS (mg/L)	2.000000	0.8849836 $\pm$ 1.2378575
General-SpCond ( $\mu$ S/cm)	296.100000	168.9833333 $\pm$ 123.7858182
General-TempAir (Degrees Celsius)	11.0	26.0
General-TempWater (Degrees Celsius)	8.800000	7.3183333 $\pm$ 2.7240839
General-Turbidity (NTU)	0.140000	0.2020000
HCO3 (mg/L)	158.000000	0.000000 $\pm$ 0.0000000
Nitrogen-NO2 (mg/L)	0.002500	0.0027500 $\pm$ 0.0062831
Nitrogen-NO2+NO3 (mg/L)	0.030000	0.0690000
Nitrogen-NO3 (mg/L)	0.030000	0.0546667 $\pm$ 0.0498148
Nitrogen-TN (mg/L)	0.210000	0.0883333 $\pm$ 0.0521943
Phosphorus-OrthoP (mg/L)	0.002500	0.0002727 $\pm$ 0.0004671
Phosphorus-TP (mg/L)	0.002500	0.0045833 $\pm$ 0.0049992