

Site Description

Study Name	CBWQ-Arrow
Site	NECAR01
Sampling Date	Oct 03 2010
Know Your Watershed Basin	Central Columbia
Province / Territory	British Columbia
Terrestrial Ecological Classification	Montane Cordillera EcoZone Columbia Mountains and Highlands EcoRegion
Coordinates (decimal degrees)	49.98750 N, 117.89167 W
Altitude	1446
Local Basin Name	Caribou Cr.
	Columbia River
Stream Order	5

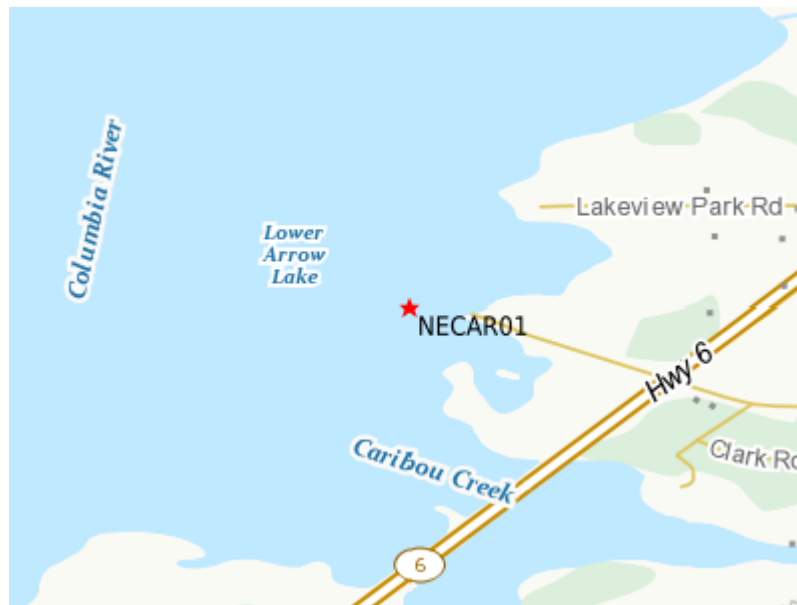
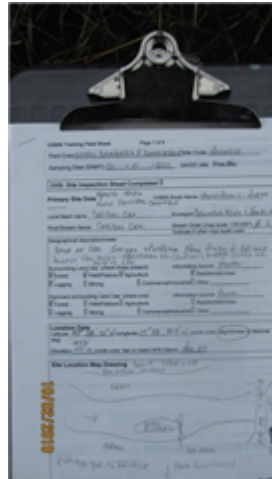


Figure 1. Location Map

Across Reach
Aerial (No image found)



Down Stream



Field Sheet

Miscellaneous (No image found)



Substrate



Up Stream

Cabin Assessment Results

Reference Model Summary

Cabin Assessment Results

Model	Columbia-Okanagan Preliminary March 2010				
Analysis Date	August 13, 2017				
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	1.8%	7.4%	7.3%	68.6%	14.9%
CABIN Assessment of NECAR01 on Oct 03, 2010	Mildly Divergent				

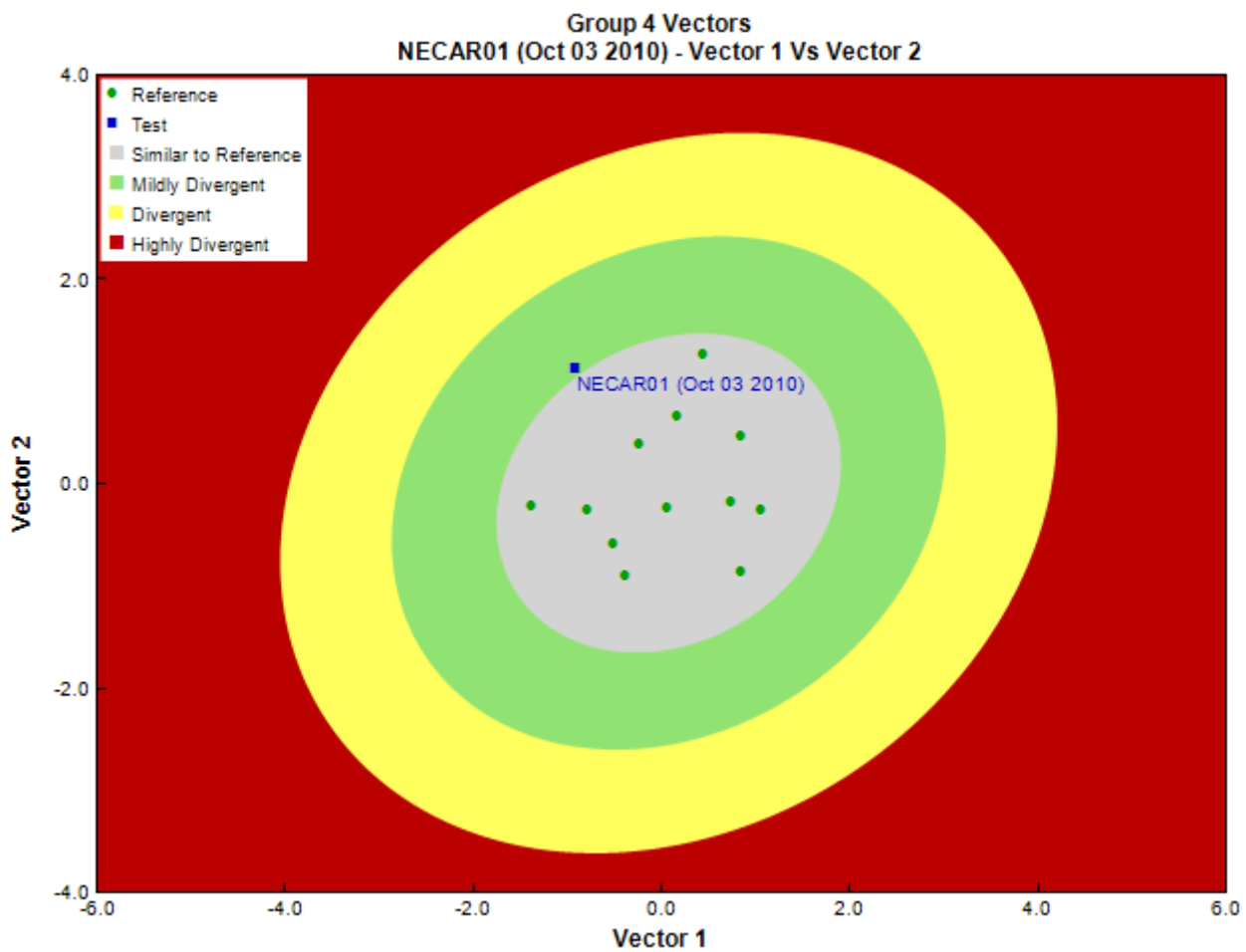


Figure 3. CABIN ordination assessment of the test site with the predicted group of reference sites. Each axis represents the relative abundance of the entire benthic invertebrate community with different organisms weighted differently on each axis.

Sample Information

Sampling Device	Kick Net
Mesh Size	400
Sampling Time	3
Taxonomist	Gary Lester, Ecoanalysts Inc.
Date Taxonomy Completed	March 09, 2011
	Marchant Box

Sample Information

Sub-Sample Proportion	45/100
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Community Structure

Phylum	Class	Order	Family	Raw Count	Total Count
Annelida	Oligochaeta	Tubificida	Naididae	2	4.4
Arthropoda	Arachnida	Trombidiformes	Hygrobatidae	2	4.4
			Lebertiidae	6	13.3
	Insecta	Diptera	Chironomidae	191	424.4
			Empididae	1	2.2
			Psychodidae	5	11.1
			Tipulidae	1	2.2
		Ephemeroptera	Ameletidae	1	2.2
			Baetidae	74	164.4
			Ephemerellidae	11	24.4
			Heptageniidae	25	55.5
		Plecoptera	Capniidae	3	6.7
			Chloroperlidae	46	102.2
			Leuctridae	1	2.2
			Nemouridae	3	6.7
			Perlodidae	6	13.3
			Taeniopterygidae	5	11.1
		Trichoptera	Glossosomatidae	1	2.2
			Lepidostomatidae	2	4.4
			Total	386	857.3

Metrics

Name	NECAR01	Predicted Group Reference Mean \pm SD
Bray-Curtis Distance	0.59	0.4 \pm 0.1
Biotic Indices		
Hilsenhoff Family index (North-West)	4.6	3.2 \pm 0.3
Intolerant taxa	--	
Long-lived taxa	--	2.1 \pm 1.0
Functional Measures		
% Filterers	--	2.2 \pm 1.8
% Gatherers	68.7	38.4 \pm 12.4
% Predatores	65.3	19.0 \pm 8.5
% Scrapers	39.1	63.2 \pm 19.7
% Shredder	3.9	27.6 \pm 15.2
No. Clinger Taxa	11.0	23.2 \pm 6.3
Number Of Individuals		
% Chironomidae	49.5	7.4 \pm 6.4
% Coleoptera	0.0	1.5 \pm 3.9
% Diptera + Non-insects	53.9	10.8 \pm 7.6
% Ephemeroptera	28.8	51.7 \pm 18.8
% Ephemeroptera that are Baetidae	66.7	40.6 \pm 30.0
% EPT Individuals	46.1	87.7 \pm 7.4
% Odonata	--	0.0 \pm 0.0
% of 2 dominant taxa	68.7	57.9 \pm 14.2
% of 5 dominant taxa	89.9	81.6 \pm 7.9
% of dominant taxa	49.5	39.8 \pm 14.9
% Plecoptera	16.6	31.4 \pm 15.4
% Tribe Tanyatarisini	--	
% Trichoptera that are Hydropsychida	0.0	27.0 \pm 26.2
% Tricoptera	0.8	4.5 \pm 2.8
No. EPT individuals/Chironomids+EPT Individuals	0.5	0.9 \pm 0.1
Richness		
Chironomidae taxa (genus level only)	1.0	1.0 \pm 0.0
Coleoptera taxa	0.0	0.4 \pm 0.5
Diptera taxa	4.0	3.3 \pm 1.0
Ephemeroptera taxa	4.0	3.8 \pm 0.8
EPT Individuals (Sum)	395.5	526.0 \pm 285.8

Metrics

Name	NECAR01	Predicted Group Reference Mean \pm SD
EPT taxa (no)	12.0	13.3 \pm 2.7

Frequency and Probability of Taxa Occurrence

Reference Model Taxa	Frequency of Occurrence in Reference Sites					Probability Of Occurrence at NECAR01
	Group 1	Group 2	Group 3	Group 4	Group 5	
Baetidae	100%	100%	100%	100%	97%	1.00
Capniidae	78%	55%	50%	92%	68%	0.82
Chironomidae	100%	100%	100%	100%	95%	0.99
Chloroperlidae	78%	88%	94%	100%	100%	0.98
Ephemerellidae	78%	100%	100%	100%	100%	1.00
Heptageniidae	100%	100%	100%	100%	100%	1.00
Hydropsychidae	11%	92%	78%	92%	86%	0.88
Nemouridae	100%	100%	100%	100%	100%	1.00
Perlidae	11%	84%	33%	100%	3%	0.78
Perlodidae	78%	78%	89%	92%	81%	0.89
Rhyacophilidae	100%	92%	100%	100%	95%	0.99
Taeniopterygidae	89%	49%	100%	92%	97%	0.90

RIVPACS Ratios

RIVPACS : Expected taxa P>0.50	13.57
RIVPACS : Observed taxa P>0.50	13.00
RIVPACS : O:E (p > 0.5)	0.96
RIVPACS : Expected taxa P>0.70	11.22
RIVPACS : Observed taxa P>0.70	9.00
RIVPACS : O:E (p > 0.7)	0.80

Habitat Description

Variable	NECAR01	Predicted Group Reference Mean \pm SD
Bedrock Geology		
Alluvium (%)	0.00000	0.00000 \pm 0.00000
Intrusive (%)	50.53120	11.07346 \pm 28.63466
Metamorphic (%)	0.00000	17.96649 \pm 35.53463
Sedimentary (%)	45.39122	70.96005 \pm 44.90394
Ultramafic (%)	0.00000	0.00000 \pm 0.00000
Volcanic (%)	4.07758	0.00000 \pm 0.00000
Channel		
Depth-Avg (cm)	33.3	23.6 \pm 11.1
Depth-BankfullMinusWetted (cm)	54.00	51.38 \pm 29.42
Depth-Max (cm)	40.0	34.6 \pm 12.3
Macrophyte (PercentRange)	0	0 \pm 0
Reach-%CanopyCoverage (PercentRange)	0.00	1.33 \pm 0.78
Reach-DomStreamsideVeg (Category (1-4))	1	4 \pm 1
Reach-Pools (Binary)	0	1 \pm 0
Reach-Rapids (Binary)	0	0 \pm 0
Reach-Riffles (Binary)	1	1 \pm 0
Reach-StraightRun (Binary)	0	1 \pm 1
Slope (m/m)	0.0019952	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)	0.65	0.48 \pm 0.22
Velocity-Max (m/s)	0.89	0.76 \pm 0.36
Width-Bankfull (m)	30.0	13.4 \pm 9.9
Width-Wetted (m)	22.0	8.5 \pm 5.8
XSEC-VelMethod (Category (1-3))	1	1 \pm 0
Climate		
Precip01_JAN (mm)	132.00000	104.85000 \pm 26.28129

Habitat Description

Variable	NECAR01	Predicted Group Reference Mean \pm SD
Precip02_FEB (mm)	105.66667	83.66667 \pm 27.10278
Precip03_MAR (mm)	93.33333	77.23611 \pm 27.15950
Precip04_APR (mm)	132.00000	104.85000 \pm 26.28129
Precip05_MAY (mm)	80.00000	71.65833 \pm 17.81753
Precip06_JUN (mm)	92.33333	78.56667 \pm 15.58521
Precip07_JUL (mm)	74.33333	64.39167 \pm 10.41611
Precip08_AUG (mm)	71.33333	60.53056 \pm 10.43373
Precip09_SEP (mm)	68.33333	56.91944 \pm 10.91783
Precip10_OCT (mm)	83.66667	65.08056 \pm 14.41229
Precip11_NOV (mm)	127.33333	105.93889 \pm 25.04104
Precip12_DEC (mm)	144.33333	116.84444 \pm 29.80954
PrecipTotal_ANNUAL (mm)	1149.66667	952.64722 \pm 226.04690
Temp01_JANMax (Degrees Celsius)	-4.33333	-4.39167 \pm 2.51268
Temp01_JANmin (Degrees Celsius)	-10.33333	-11.40833 \pm 3.53951
Temp02_FEBmax (Degrees Celsius)	-1.33333	-1.70000 \pm 2.12945
Temp02_FEBmin (Degrees Celsius)	-8.33333	-9.17500 \pm 3.33361
Temp03_MARmax (Degrees Celsius)	2.00000	2.50556 \pm 2.87525
Temp03_MARmin (Degrees Celsius)	-5.66667	-6.14167 \pm 2.98556
Temp04_APRmax (Degrees Celsius)	7.00000	7.12222 \pm 3.48771
Temp04_APRmin (Degrees Celsius)	-2.33333	-2.71667 \pm 2.22785
Temp05_MAYmax (Degrees Celsius)	11.66667	12.03889 \pm 3.55434
Temp05_MAYmin (Degrees Celsius)	0.66667	1.04722 \pm 2.08663
Temp06_JUNMax (Degrees Celsius)	15.33333	15.72500 \pm 3.40030
Temp06_JUNMin (Degrees Celsius)	3.66667	4.00278 \pm 2.41085
Temp07_JULmax (Degrees Celsius)	19.33333	19.56111 \pm 3.47275
Temp07_JULmin (Degrees Celsius)	6.66667	6.35833 \pm 2.28332
Temp08_AUGmax (Degrees Celsius)	19.00000	19.52222 \pm 3.51100
Temp08_AUGmin (Degrees Celsius)	6.66667	6.19167 \pm 2.34422
Temp09_SEPmax (Degrees Celsius)	13.66667	14.04444 \pm 3.03456
Temp09_SEPmin (Degrees Celsius)	2.66667	2.04722 \pm 2.37208
Temp10_OCTmax (Degrees Celsius)	6.33333	6.88889 \pm 2.71577
Temp10_OCTmin (Degrees Celsius)	-1.33333	-1.46111 \pm 1.64316
Temp11_NOVmax (Degrees Celsius)	-0.66667	-0.79722 \pm 2.43512
Temp11_NOVmin (Degrees Celsius)	-6.33333	-6.68056 \pm 2.97163
Temp12_DECmax (Degrees Celsius)	-4.33333	-4.66389 \pm 2.69757
Temp12_DECmin (Degrees Celsius)	-10.00000	-10.65833 \pm 3.71739
TempANNUALmax (Degrees Celsius)	6.33333	6.96389 \pm 3.06157
TempANNUALmean (Degrees Celsius)	2.33333	2.25278 \pm 2.66574
TempANNUALmin (Degrees Celsius)	-1.33333	-2.18056 \pm 2.41152
Hydrology		
Drainage-Area (km ²)	237.82223	124.42081 \pm 200.99192
Perimeter (Km)	107.64410	64.71360 \pm 56.15436
StreamDensity (m/km ²)	3675.02753	2246.06682 \pm 604.89962
StreamLength (m)	874003.24	302226.63 \pm 500983.26
Landcover		
Natl-AnnCrops (%)	0.00000	0.00000 \pm 0.00000
Natl-Barren (%)	0.00000	0.00000 \pm 0.00000
Natl-BroadleafDense (%)	0.00000	0.00000 \pm 0.00000
Natl-BroadleafOpen (%)	3.68838	1.19263 \pm 2.03874
Natl-BroadleafSparse (%)	0.00000	0.00000 \pm 0.00000
Natl-Coniferous (%)	0.00000	0.00000 \pm 0.00000
Natl-ConiferousDense (%)	0.54200	0.64845 \pm 0.37668
Natl-ConiferousOpen (%)	62.36723	54.62780 \pm 18.30692
Natl-ConiferousSparse (%)	2.24822	0.94121 \pm 1.53621
Natl-Deciduous (%)	0.00000	0.00000 \pm 0.00000
Natl-Developed (%)	0.00000	0.00000 \pm 0.00000
Natl-ExposedLand (%)	8.74200	13.20054 \pm 11.11850
Natl-Grassland (%)	0.00000	1.87556 \pm 1.68508
Natl-Herb (%)	7.85241	5.75738 \pm 2.89836
Natl-MixedForest (%)	0.00000	0.00000 \pm 0.00000
Natl-MixedwoodDense (%)	0.00000	0.00000 \pm 0.00000
Natl-MixedwoodOpen (%)	0.09597	0.04060 \pm 0.10208

Habitat Description

Variable	NECAR01	Predicted Group Reference Mean \pm SD
Natl-MixedwoodSparse (%)	0.00000	0.00000 \pm 0.00000
Natl-PerennCropsPast (%)	0.00000	0.00000 \pm 0.00000
Natl-Rock/Rubble (%)	0.25364	1.56403 \pm 2.75979
Natl-Shrubland (%)	0.00000	0.00000 \pm 0.00000
Natl-ShrubLow (%)	0.65271	4.98298 \pm 3.22579
Natl-ShrubTall (%)	0.00000	0.00000 \pm 0.00000
Natl-SnowIce (%)	0.00794	0.08491 \pm 0.15475
Natl-Water (%)	0.04197	0.22916 \pm 0.36834
Natl-Wetland (%)	0.00000	0.00000 \pm 0.00000
Natl-WetlandHerb (%)	0.07541	0.12918 \pm 0.35193
Natl-WetlandShrub (%)	0.00858	0.00000 \pm 0.00000
Natl-WetlandTreed (%)	0.00000	0.00000 \pm 0.00000
Reg-Ice (%)	0.00000	0.02487 \pm 0.06034
Sediment Chemistry		
Ag (ppm)	0.120	0.000
Al (ppm)	9570.000	0.005
As (ppm)	17.700	0.000
Ba (ppm)	62.600	0.068
Be (ppm)	0.300	0.000
Bi (ppm)	0.050	0.000
Ca (ppm)	3650.000	21.108 \pm 16.801
Cd (ppm)	0.470	0.000
Co (ppm)	5.900	0.000
Cr (ppm)	17.000	0.000
Cu (ppm)	15.000	0.000
Fe (ppm)	21900.000	0.008
Hg (ppm)	0.025	0.000 \pm 0.000
K (ppm)	1560.000	0.614 \pm 0.406
Li (ppm)	18.000	0.001
Mg (ppm)	6590.000	7.667 \pm 7.975
Mn (ppm)	306.000	0.001
Mo (ppm)	0.900	0.001
Na (ppm)	134.000	1.538 \pm 1.275
Ni (ppm)	14.200	0.000
Pb (ppm)	9.700	0.000
Sb (ppm)	0.300	0.000
Se (ppm)	0.600	0.000
Sn (ppm)	0.200	0.000
Sr (ppm)	23.800	0.044
Ti (ppm)	621.000	0.001
Tl (ppm)	0.120	0.000
TP (ppm)	905.000	0.000 \pm 0.000
U (ppm)	0.810	0.001
V (ppm)	43.000	0.000
Zn (ppm)	68.000	0.001
Zr (ppm)	0.600	0.000 \pm 0.000
Substrate Data		
%Bedrock (%)	0	0 \pm 0
%Boulder (%)	2	9 \pm 9
%Cobble (%)	73	51 \pm 15
%Gravel (%)	1	3 \pm 3
%Pebble (%)	24	37 \pm 20
%Sand (%)	0	0 \pm 0
%Silt+Clay (%)	0	0 \pm 0
D50 (cm)	9.35	15.12 \pm 14.26
Dg (cm)	8.3	8.2 \pm 2.8
Dominant-1st (Category(0-9))	6	7 \pm 1
Dominant-2nd (Category(0-9))	7	7 \pm 1
Embeddedness (Category(1-5))	4	5 \pm 1
PeriphytonCoverage (Category(1-5))	3	1 \pm 0
Topography		
ElevationMax (m)	2671.00000	2634.66667 \pm 309.54023

Habitat Description

Variable	NECAR01	Predicted Group Reference Mean \pm SD
ElevationMin (m)	439.00000	913.41667 \pm 271.25180
ElevationStdev (m)	415.94583	349.02363 \pm 92.12445
Reg-SlopeLT30% (%)	20.21000	18.88386 \pm 9.29866
Slope30-50% (%)	28.63164	29.00215 \pm 6.33837
Slope50-60% (%)	15.79183	13.91808 \pm 1.91315
SlopeAvg (%)	50.07479	52.79851 \pm 8.68755
SlopeGT60% (%)	33.33831	35.47207 \pm 13.39684
SlopeLT30% (%)	22.23822	21.60770 \pm 8.54172
SlopeMax (%)	215.77939	298.94390 \pm 146.30679
SlopeMin (%)	0.00000	0.19777 \pm 0.29213
SlopeStdev (%)	24.20049	26.57529 \pm 4.62351
Water Chemistry		
General-Alkalinity (mg/L)	38.0000000	71.7000000 \pm 53.9231440
General-DO (mg/L)	10.0000000	11.4175000 \pm 0.7986708
General-pH (pH)	7.6	7.9 \pm 0.4
General-SpCond (μ S/cm)	94.8000000	168.9833333 \pm 123.7858182
General-TempAir (Degrees Celsius)	14.0	26.0
General-TempWater (Degrees Celsius)	9.1000000	7.3183333 \pm 2.7240839
General-Turbidity (NTU)	0.4700000	0.2020000
Nitrogen-NO2 (mg/L)	0.0025000	0.0027500 \pm 0.0062831
Nitrogen-NO2+NO3 (mg/L)	0.0700000	0.0690000
Nitrogen-NO3 (mg/L)	0.0700000	0.0546667 \pm 0.0498148
Phosphorus-OrthoP (mg/L)	0.0025000	0.0002727 \pm 0.0004671