

Site Description

Study Name	CBWQ-Arrow
Site	NEBUR01
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)	49.96756 N, 117.88278 W
Altitude	1673
Local Basin Name	Burton Cr.
	Columbia River
Stream Order	5

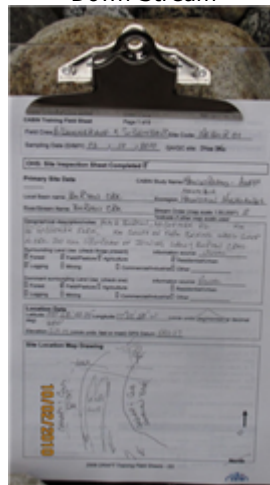


Figure 1. Location Map

Across Reach
Aerial (No image found)



Down Stream



Field Sheet

Miscellaneous (No image found)



Substrate



Up Stream

Cabin Assessment Results

Reference Model Summary					
Model	Columbia-Okanagan Preliminary March 2010				
Analysis Date	August 04, 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	0.4%	6.3%	6.6%	70.3%	16.4%
CABIN Assessment of NEBUR01 on Oct 03, 2010	Similar to Reference				

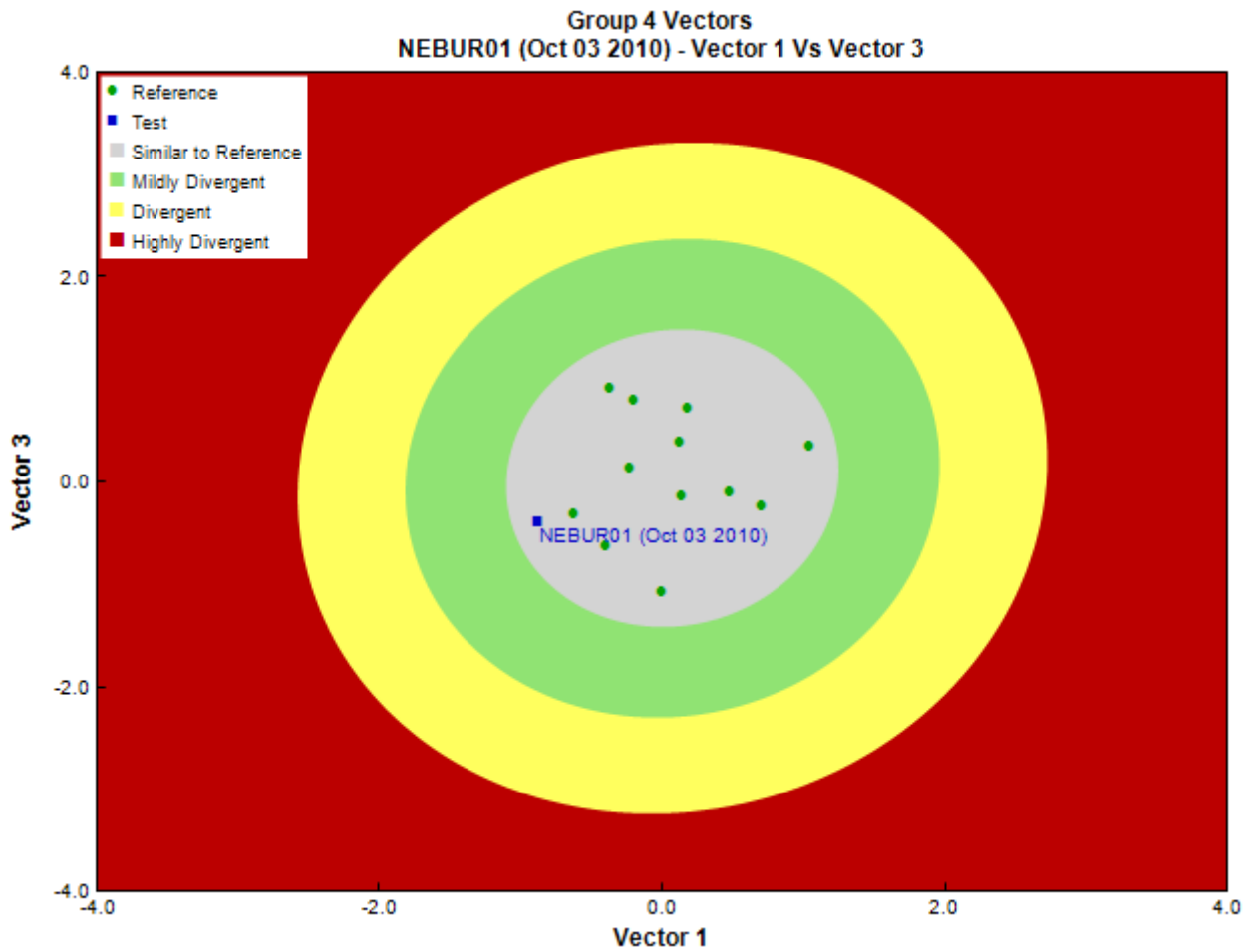


Figure 3. CABIN ordination assessment of the test site with the predicted group of reference sites. Each axis represents the relative abundance of the entire benthic invertebrate community with different organisms weighted differently on each axis.

Sample Information

Sampling Device	Kick Net
Mesh Size	400
Sampling Time	3
Taxonomist	Gary Lester, Ecoanalysts Inc.
Date Taxonomy Completed	March 09, 2011
	Marchant Box
Sub-Sample Proportion	21/100

Community Structure

Phylum	Class	Order	Family	Raw Count	Total Count	
Arthropoda	Arachnida	Sarcoptiformes		1	4.8	
		Trombidiformes	Lebertiidae	2	9.5	
	Insecta	Coleoptera		Elmidae	2	9.5
			Diptera	Ceratopogonidae	1	4.8
				Chironomidae	50	238.1
				Psychodidae	7	33.3
				Tipulidae	5	23.8
			Ephemeroptera	Baetidae	72	342.9
				Ephemerellidae	23	109.5
				Heptageniidae	99	471.4
				Leptophlebiidae	1	4.8
			Plecoptera	Capniidae	3	14.3
				Chloroperlidae	15	71.4
				Nemouridae	8	38.1
		Perlidae	4	19.0		

Community Structure

Phylum	Class	Order	Family	Raw Count	Total Count
			Perlodidae	2	9.5
			Taeniopterygidae	15	71.4
		Trichoptera	Apataniidae	8	38.1
			Brachycentridae	2	9.5
			Lepidostomatidae	1	4.8
			Rhyacophilidae	6	28.6
			Total	327	1,557.1

Metrics

Name	NEBUR01	Predicted Group Reference Mean \pm SD
Bray-Curtis Distance	0.56	0.4 \pm 0.1
Biotic Indices		
Hilsenhoff Family index (North-West)	3.8	3.2 \pm 0.3
Intolerant taxa	--	
Long-lived taxa	2.0	2.1 \pm 1.0
Tolerant individuals (%)	--	0.8 \pm 0.3
Functional Measures		
% Filterers	0.6	2.2 \pm 1.8
% Gatherers	39.4	38.4 \pm 12.4
% Predators	24.5	19.0 \pm 8.5
% Scrapers	64.8	63.2 \pm 19.7
% Shredder	13.5	27.6 \pm 15.2
No. Clinger Taxa	14.0	23.2 \pm 6.3
Number Of Individuals		
% Chironomidae	15.3	7.4 \pm 6.4
% Coleoptera	0.6	1.5 \pm 3.9
% Diptera + Non-insects	19.9	10.8 \pm 7.6
% Ephemeroptera	59.8	51.7 \pm 18.8
% Ephemeroptera that are Baetidae	36.9	40.6 \pm 30.0
% EPT Individuals	79.4	87.7 \pm 7.4
% Odonata	--	0.0 \pm 0.0
% of 2 dominant taxa	52.5	57.9 \pm 14.2
% of 5 dominant taxa	79.5	81.6 \pm 7.9
% of dominant taxa	30.4	39.8 \pm 14.9
% Plecoptera	14.4	31.4 \pm 15.4
% Tribe Tanyatarisini	--	
% Trichoptera that are Hydropsychida	0.0	27.0 \pm 26.2
% Tricoptera	5.2	4.5 \pm 2.8
No. EPT individuals/Chironomids+EPT Individuals	0.8	0.9 \pm 0.1
Total Abundance	1557.0	587.4 \pm 299.1
Richness		
Chironomidae taxa (genus level only)	1.0	1.0 \pm 0.0
Coleoptera taxa	1.0	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)	1233.3	526.0 \pm 285.8
EPT taxa (no)	14.0	13.3 \pm 2.7
Odonata taxa	--	0.0 \pm 0.0
Pielou's Evenness	0.7	0.7 \pm 0.1
Plecoptera taxa	6.0	6.3 \pm 1.1
Shannon-Wiener Diversity	2.1	1.9 \pm 0.4
Simpson's Diversity	0.8	0.8 \pm 0.1
Simpson's Evenness	0.3	0.3 \pm 0.1
Total No. of Taxa	20.0	19.3 \pm 3.7
Trichoptera taxa	4.0	3.2 \pm 1.4

Frequency and Probability of Taxa Occurrence

Reference Model Taxa	Frequency of Occurrence in Reference Sites					Probability Of Occurrence at NEBUR01
	Group 1	Group 2	Group 3	Group 4	Group 5	
Baetidae	100%	100%	100%	100%	97%	1.00

Frequency and Probability of Taxa Occurrence

Reference Model Taxa	Frequency of Occurrence in Reference Sites					Probability Of Occurrence at NEBUR01
	Group 1	Group 2	Group 3	Group 4	Group 5	
Capniidae	78%	55%	50%	92%	68%	0.83
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%	0.90
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	13.62
RIVPACS : Observed taxa P>0.50	12.00
RIVPACS : O:E (p > 0.5)	0.88
RIVPACS : Expected taxa P>0.70	11.26
RIVPACS : Observed taxa P>0.70	11.00
RIVPACS : O:E (p > 0.7)	0.98

Habitat Description

Variable	NEBUR01	Predicted Group Reference Mean \pm SD
Bedrock Geology		
Alluvium (%)	0.00000	0.00000 \pm 0.00000
Intrusive (%)	88.94617	11.07346 \pm 28.63466
Metamorphic (%)	10.03602	17.96649 \pm 35.53463
Sedimentary (%)	1.01781	70.96005 \pm 44.90394
Ultramafic (%)	0.00000	0.00000 \pm 0.00000
Volcanic (%)	0.00000	0.00000 \pm 0.00000
Channel		
Depth-Avg (cm)	24.7	23.6 \pm 11.1
Depth-BankfullMinusWetted (cm)	110.00	51.38 \pm 29.42
Depth-Max (cm)	46.0	34.6 \pm 12.3
Macrophyte (PercentRange)	0	0 \pm 0
Reach-%CanopyCoverage (PercentRange)	1.00	1.33 \pm 0.78
Reach-DomStreamsideVeg (Category (1-4))	4	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)	1	1 \pm 1
Slope (m/m)	0.0190000	0.0546683 \pm 0.0376269
Veg-Coniferous (Binary)	1	1 \pm 0
Veg-Deciduous (Binary)	1	1 \pm 0
Veg-GrassesFerns (Binary)	0	1 \pm 0
Veg-Shrubs (Binary)	1	1 \pm 0
Velocity-Avg (m/s)	0.74	0.48 \pm 0.22
Velocity-Max (m/s)	1.17	0.76 \pm 0.36
Width-Bankfull (m)	32.0	13.4 \pm 9.9
Width-Wetted (m)	20.0	8.5 \pm 5.8
XSEC-VelMethod (Category (1-3))	1	1 \pm 0
Climate		
Precip01_JAN (mm)	136.50000	104.85000 \pm 26.28129
Precip02_FEB (mm)	113.50000	83.66667 \pm 27.10278
Precip03_MAR (mm)	104.00000	77.23611 \pm 27.15950
Precip04_APR (mm)	136.50000	104.85000 \pm 26.28129
Precip05_MAY (mm)	85.50000	71.65833 \pm 17.81753
Precip06_JUN (mm)	96.00000	78.56667 \pm 15.58521
Precip07_JUL (mm)	75.50000	64.39167 \pm 10.41611
Precip08_AUG (mm)	72.50000	60.53056 \pm 10.43373

Habitat Description

Variable	NEBUR01	Predicted Group Reference Mean \pm SD
Precip09_SEP (mm)	69.00000	56.91944 \pm 10.91783
Precip10_OCT (mm)	82.50000	65.08056 \pm 14.41229
Precip11_NOV (mm)	128.00000	105.93889 \pm 25.04104
Precip12_DEC (mm)	150.50000	116.84444 \pm 29.80954
PrecipTotal_ANNUAL (mm)	1195.50000	952.64722 \pm 226.04690
Temp01_JANMax (Degrees Celsius)	-5.00000	-4.39167 \pm 2.51268
Temp01_JANmin (Degrees Celsius)	-11.00000	-11.40833 \pm 3.53951
Temp02_FEBmax (Degrees Celsius)	-2.50000	-1.70000 \pm 2.12945
Temp02_FEBmin (Degrees Celsius)	-9.00000	-9.17500 \pm 3.33361
Temp03_MARmax (Degrees Celsius)	1.00000	2.50556 \pm 2.87525
Temp03_MARmin (Degrees Celsius)	-7.00000	-6.14167 \pm 2.98556
Temp04_APRmax (Degrees Celsius)	5.00000	7.12222 \pm 3.48771
Temp04_APRmin (Degrees Celsius)	-3.00000	-2.71667 \pm 2.22785
Temp05_MAYmax (Degrees Celsius)	10.00000	12.03889 \pm 3.55434
Temp05_MAYmin (Degrees Celsius)	0.50000	1.04722 \pm 2.08663
Temp06_JUNMax (Degrees Celsius)	13.00000	15.72500 \pm 3.40030
Temp06_JUNMin (Degrees Celsius)	3.00000	4.00278 \pm 2.41085
Temp07_JULmax (Degrees Celsius)	17.00000	19.56111 \pm 3.47275
Temp07_JULmin (Degrees Celsius)	5.50000	6.35833 \pm 2.28332
Temp08_AUGmax (Degrees Celsius)	17.00000	19.52222 \pm 3.51100
Temp08_AUGmin (Degrees Celsius)	5.50000	6.19167 \pm 2.34422
Temp09_SEPmax (Degrees Celsius)	12.00000	14.04444 \pm 3.03456
Temp09_SEPmin (Degrees Celsius)	1.50000	2.04722 \pm 2.37208
Temp10_OCTmax (Degrees Celsius)	4.50000	6.88889 \pm 2.71577
Temp10_OCTmin (Degrees Celsius)	-1.50000	-1.46111 \pm 1.64316
Temp11_NOVmax (Degrees Celsius)	-1.50000	-0.79722 \pm 2.43512
Temp11_NOVmin (Degrees Celsius)	-7.00000	-6.68056 \pm 2.97163
Temp12_DECmax (Degrees Celsius)	-5.00000	-4.66389 \pm 2.69757
Temp12_DECmin (Degrees Celsius)	-10.50000	-10.65833 \pm 3.71739
TempANNUALmax (Degrees Celsius)	5.00000	6.96389 \pm 3.06157
TempANNUALmean (Degrees Celsius)	1.00000	2.25278 \pm 2.66574
TempANNUALmin (Degrees Celsius)	-2.50000	-2.18056 \pm 2.41152
Hydrology		
Drainage-Area (km ²)	156.03797	124.42081 \pm 200.99192
Perimeter (Km)	96.29101	64.71360 \pm 56.15436
StreamDensity (m/km ²)	3088.41775	2246.06682 \pm 604.89962
StreamLength (m)	481910.43	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 (%)	2.15359	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 (%)	0.52673	0.64845 \pm 0.37668
Natl-ConiferousOpen (%)	55.67391	54.62780 \pm 18.30692
Natl-ConiferousSparse (%)	1.69933	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 (%)	18.72158	13.20054 \pm 11.11850
Natl-Grassland (%)	0.00000	1.87556 \pm 1.68508
Natl-Herb (%)	5.14233	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 (%)	0.22226	0.04060 \pm 0.10208
Natl-MixedwoodSparse (%)	0.00000	0.00000 \pm 0.00000
Natl-PerennCropsPast (%)	0.00000	0.00000 \pm 0.00000
Natl-Rock/Rubble (%)	0.64975	1.56403 \pm 2.75979
Natl-Shrubland (%)	0.00000	0.00000 \pm 0.00000
Natl-ShrubLow (%)	0.29041	4.98298 \pm 3.22579
Natl-ShrubTall (%)	0.00000	0.00000 \pm 0.00000
Natl-SnowIce (%)	0.02825	0.08491 \pm 0.15475

Habitat Description

Variable	NEBUR01	Predicted Group Reference Mean \pm SD
Natl-Water (%)	0.31107	0.22916 \pm 0.36834
Natl-Wetland (%)	0.00000	0.00000 \pm 0.00000
Natl-WetlandHerb (%)	0.02206	0.12918 \pm 0.35193
Natl-WetlandShrub (%)	0.00000	0.00000 \pm 0.00000
Natl-WetlandTreed (%)	0.00000	0.00000 \pm 0.00000
Reg-Ice (%)	0.00000	0.02487 \pm 0.06034
Substrate Data		
%Bedrock (%)	0	0 \pm 0
%Boulder (%)	2	9 \pm 9
%Cobble (%)	61	51 \pm 15
%Gravel (%)	2	3 \pm 3
%Pebble (%)	35	37 \pm 20
%Sand (%)	0	0 \pm 0
%Silt+Clay (%)	0	0 \pm 0
D50 (cm)	9.20	15.12 \pm 14.26
Dg (cm)	8.0	8.2 \pm 2.8
Dominant-1st (Category(0-9))	6	7 \pm 1
Dominant-2nd (Category(0-9))	5	7 \pm 1
Embeddedness (Category(1-5))	4	5 \pm 1
PeriphytonCoverage (Category(1-5))	3	1 \pm 0
Topography		
ElevationMax (m)	2735.00000	2634.66667 \pm 309.54023
ElevationMin (m)	457.00000	913.41667 \pm 271.25180
ElevationStdev (m)	449.76775	349.02363 \pm 92.12445
Reg-SlopeLT30% (%)	17.01000	18.88386 \pm 9.29866
Slope30-50% (%)	28.38185	29.00215 \pm 6.33837
Slope50-60% (%)	14.69809	13.91808 \pm 1.91315
SlopeAvg (%)	52.80717	52.79851 \pm 8.68755
SlopeGT60% (%)	36.42654	35.47207 \pm 13.39684
SlopeLT30% (%)	20.49352	21.60770 \pm 8.54172
SlopeMax (%)	261.08899	298.94390 \pm 146.30679
SlopeMin (%)	0.00000	0.19777 \pm 0.29213
SlopeStdev (%)	26.65419	26.57529 \pm 4.62351
Water Chemistry		
General-Alkalinity (mg/L)	28.0000000	71.7000000 \pm 53.9231440
General-DO (mg/L)	11.0000000	11.4175000 \pm 0.7986708
General-pH (pH)	7.5	7.9 \pm 0.4
General-SpCond (μ S/cm)	65.3000000	168.9833333 \pm 123.7858182
General-TempAir (Degrees Celsius)	9.5	26.0
General-TempWater (Degrees Celsius)	8.7000000	7.3183333 \pm 2.7240839
General-Turbidity (NTU)	0.2100000	0.2020000
Nitrogen-NO2 (mg/L)	0.0025000	0.0027500 \pm 0.0062831
Nitrogen-NO2+NO3 (mg/L)	0.0400000	0.0690000
Nitrogen-NO3 (mg/L)	0.0400000	0.0546667 \pm 0.0498148
Phosphorus-OrthoP (mg/L)	0.0025000	0.0002727 \pm 0.0004671