

Site Description

Study Name	CBWQ-Slocan
Site	NJCAR01
Sampling Date	Oct 15 2008
Know Your Watershed Basin	Slocan
Province / Territory	British Columbia
Terrestrial Ecological Classification	Montane Cordillera EcoZone Columbia Mountains and Highlands EcoRegion
Coordinates (decimal degrees)	49.96667 N, 117.46667 W
Altitude	
Local Basin Name	Carpenter Creek
	Slocan
Stream Order	4



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	September 05, 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	3.4%	3.7%	10.9%	68.0%	13.9%	
CABIN Assessment of NJCAR01 on Oct 15, 2008	Mildly Divergent					

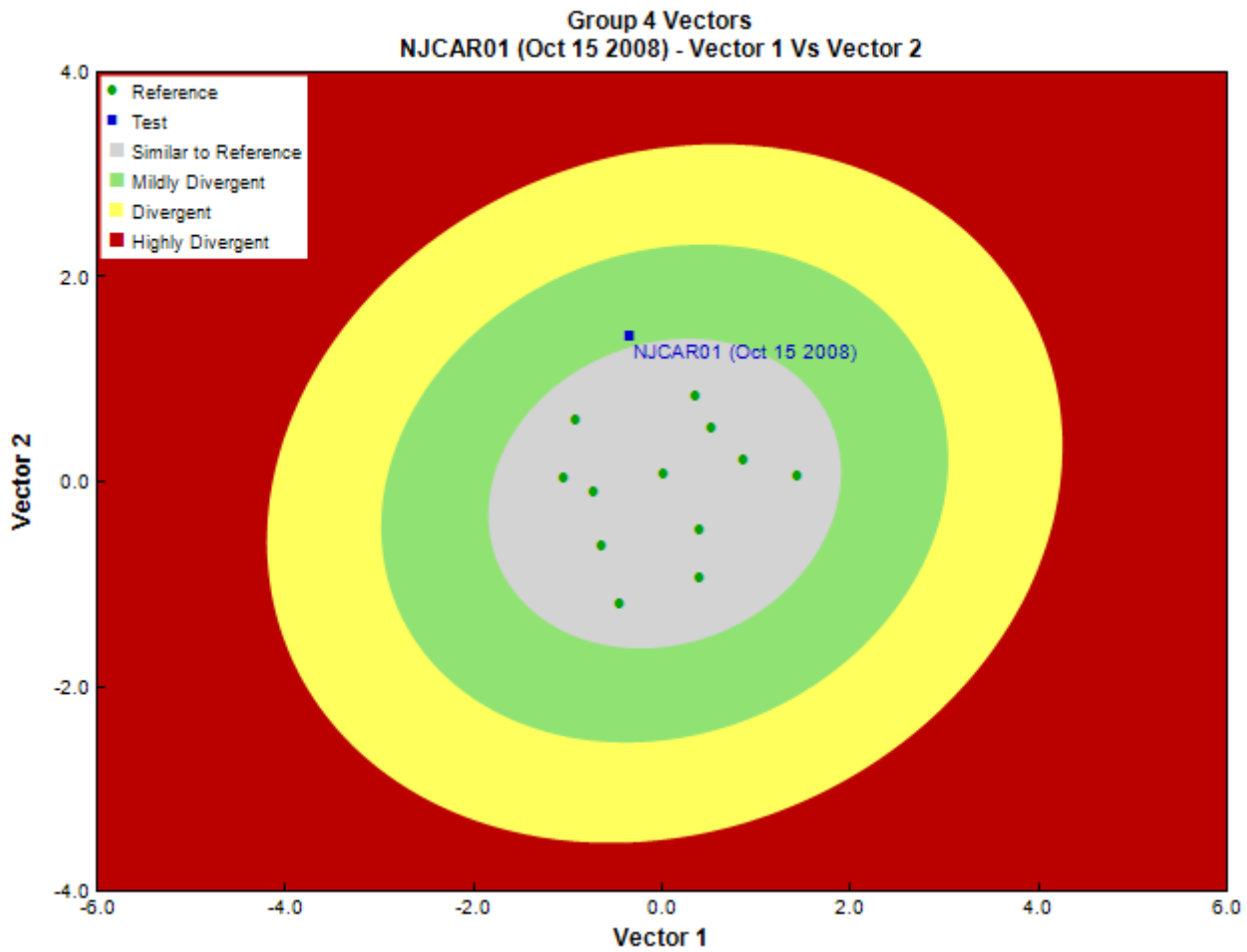


Figure 3. CABIN ordination assessment of the test site with the predicted group of reference sites. Each axis represents the relative abundance of the entire benthic invertebrate community with different organisms weighted differently on each axis.

Sample Information

Sampling Device	Kick Net
Mesh Size	400
Sampling Time	3
Taxonomist	Dave Langill, EcoAnalysts, Inc.
Date Taxonomy Completed	November 23, 2008
	Marchant Box
Sub-Sample Proportion	100/100

Community Structure

Phylum	Class	Order	Family	Raw Count	Total Count	
Annelida	Oligochaeta	Lumbriculida		4	4.0	
Arthropoda	Arachnida	Trombidiformes	Lebertiidae	1	1.0	
	Insecta	Diptera	Chironomidae	15	15.0	
Empididae			4	4.0		
Ephemeroptera			Ameletidae	1	1.0	
				Baetidae	15	15.0
				Ephemeridae	12	12.0
				Heptageniidae	14	14.0
		Plecoptera	Capniidae	6	6.0	
				Chloroperlidae	21	21.0
				Nemouridae	30	30.0
				Peltoperlidae	1	1.0
				Perlodidae	5	5.0
				Taeniopterygidae	246	246.0
		Trichoptera	Apataniidae	2	2.0	

Community Structure

Phylum	Class	Order	Family	Raw Count	Total Count
			Brachycentridae	2	2.0
			Glossosomatidae	31	31.0
			Hydropsychidae	3	3.0
			Rhyacophilidae	8	8.0
Platyhelminthes	Turbellaria	Tricladida	Planariidae	1	1.0
			Total	422	422.0

Metrics

Name	NJCAR01	Predicted Group Reference Mean \pm SD
Bray-Curtis Distance	0.56	0.4 \pm 0.1
Biotic Indices		
Hilsenhoff Family index (North-West)	2.1	3.2 \pm 0.3
Intolerant taxa	--	
Long-lived taxa	--	2.1 \pm 1.0
Tolerant individuals (%)	--	0.8 \pm 0.3
Functional Measures		
% Filterers	1.2	2.2 \pm 1.8
% Gatherers	74.9	38.4 \pm 12.4
% Predatores	16.4	19.0 \pm 8.5
% Scrapers	78.0	63.2 \pm 19.7
% Shredder	68.0	27.6 \pm 15.2
No. Clinger Taxa	12.0	23.2 \pm 6.3
Number Of Individuals		
% Chironomidae	3.6	7.4 \pm 6.4
% Coleoptera	0.0	1.5 \pm 3.9
% Diptera + Non-insects	5.0	10.8 \pm 7.6
% Ephemeroptera	10.0	51.7 \pm 18.8
% Ephemeroptera that are Baetidae	35.7	40.6 \pm 30.0
% EPT Individuals	95.0	87.7 \pm 7.4
% Odonata	0.0	0.0 \pm 0.0
% of 2 dominant taxa	66.3	57.9 \pm 14.2
% of 5 dominant taxa	82.1	81.6 \pm 7.9
% of dominant taxa	58.9	39.8 \pm 14.9
% Plecoptera	73.9	31.4 \pm 15.4
% Tribe Tanyatarisini	--	
% Trichoptera that are Hydropsychida	6.5	27.0 \pm 26.2
% Tricoptera	11.0	4.5 \pm 2.8
No. EPT individuals/Chironomids+EPT Individuals	1.0	0.9 \pm 0.1
Total Abundance	422.0	587.4 \pm 299.1
Richness		
Chironomidae taxa (genus level only)	1.0	1.0 \pm 0.0
Coleoptera taxa	0.0	0.4 \pm 0.5
Diptera taxa	2.0	3.3 \pm 1.0
Ephemeroptera taxa	4.0	3.8 \pm 0.8
EPT Individuals (Sum)	397.0	526.0 \pm 285.8
EPT taxa (no)	15.0	13.3 \pm 2.7
Odonata taxa	0.0	0.0 \pm 0.0
Pielou's Evenness	0.6	0.7 \pm 0.1
Plecoptera taxa	6.0	6.3 \pm 1.1
Shannon-Wiener Diversity	1.7	1.9 \pm 0.4
Simpson's Diversity	0.6	0.8 \pm 0.1
Simpson's Evenness	0.1	0.3 \pm 0.1
Total No. of Taxa	19.0	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 NJCAR01
	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

Frequency and Probability of Taxa Occurrence

Reference Model Taxa	Frequency of Occurrence in Reference Sites					Probability Of Occurrence at NJCAR01
	Group 1	Group 2	Group 3	Group 4	Group 5	
Chironomidae	100%	100%	100%	100%	95%	0.99
Chloroperlidae	78%	88%	94%	100%	100%	0.98
EphemereIIDae	78%	100%	100%	100%	100%	0.99
Heptageniidae	100%	100%	100%	100%	100%	1.00
Hydropsychidae	11%	92%	78%	92%	86%	0.87
Nemouridae	100%	100%	100%	100%	100%	1.00
Perlidae	11%	84%	33%	100%	3%	0.75
Perlodidae	78%	78%	89%	92%	81%	0.89
Rhyacophilidae	100%	92%	100%	100%	95%	0.99
Taeniopterygidae	89%	49%	100%	92%	97%	0.92

RIVPACS Ratios

RIVPACS : Expected taxa P>0.50	13.03
RIVPACS : Observed taxa P>0.50	11.00
RIVPACS : O:E (p > 0.5)	0.84
RIVPACS : Expected taxa P>0.70	11.20
RIVPACS : Observed taxa P>0.70	10.00
RIVPACS : O:E (p > 0.7)	0.89

Habitat Description

Variable	NJCAR01	Predicted Group Reference Mean \pm SD
Bedrock Geology		
Alluvium (%)	0.00000	0.00000 \pm 0.00000
Intrusive (%)	11.20805	11.07346 \pm 28.63466
Metamorphic (%)	12.95645	17.96649 \pm 35.53463
Sedimentary (%)	75.83549	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)	38.4	23.6 \pm 11.1
Depth-Max (cm)	40.0	34.6 \pm 12.3
Macrophyte (PercentRange)	1	0 \pm 0
Reach-%CanopyCoverage (PercentRange)	1.00	1.33 \pm 0.78
Reach-%Logging (PercentRange)	2	0 \pm 0
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
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)	0.68	0.48 \pm 0.22
Velocity-Max (m/s)	0.91	0.76 \pm 0.36
Width-Bankfull (m)	34.4	13.4 \pm 9.9
XSEC-VelInstrumentDirect (Category (1-3))	3	0 \pm 0
XSEC-VelMethod (Category (1-3))	3	1 \pm 0
Climate		
Precip01_JAN (mm)	141.66667	104.85000 \pm 26.28129
Precip02_FEB (mm)	117.00000	83.66667 \pm 27.10278
Precip03_MAR (mm)	104.33333	77.23611 \pm 27.15950
Precip04_APR (mm)	141.66667	104.85000 \pm 26.28129
Precip05_MAY (mm)	81.00000	71.65833 \pm 17.81753
Precip06_JUN (mm)	92.00000	78.56667 \pm 15.58521
Precip07_JUL (mm)	77.00000	64.39167 \pm 10.41611
Precip08_AUG (mm)	74.00000	60.53056 \pm 10.43373
Precip09_SEP (mm)	70.00000	56.91944 \pm 10.91783
Precip10_OCT (mm)	87.33333	65.08056 \pm 14.41229
Precip11_NOV (mm)	140.66667	105.93889 \pm 25.04104

Habitat Description

Variable	NJCAR01	Predicted Group Reference Mean \pm SD
Precip12_DEC (mm)	156.33333	116.84444 \pm 29.80954
PrecipTotal_ANNUAL (mm)	1221.66667	952.64722 \pm 226.04690
Temp01_JANMax (Degrees Celsius)	-5.66667	-4.39167 \pm 2.51268
Temp01_JANmin (Degrees Celsius)	-12.00000	-11.40833 \pm 3.53951
Temp02_FEBmax (Degrees Celsius)	-2.66667	-1.70000 \pm 2.12945
Temp02_FEBmin (Degrees Celsius)	-10.00000	-9.17500 \pm 3.33361
Temp03_MARmax (Degrees Celsius)	0.33333	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)	-3.33333	-2.71667 \pm 2.22785
Temp05_MAYmax (Degrees Celsius)	9.66667	12.03889 \pm 3.55434
Temp05_MAYmin (Degrees Celsius)	0.33333	1.04722 \pm 2.08663
Temp06_JUNMax (Degrees Celsius)	13.33333	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)	5.00000	6.35833 \pm 2.28332
Temp08_AUGmax (Degrees Celsius)	17.00000	19.52222 \pm 3.51100
Temp08_AUGmin (Degrees Celsius)	5.00000	6.19167 \pm 2.34422
Temp09_SEPmax (Degrees Celsius)	12.00000	14.04444 \pm 3.03456
Temp09_SEPmin (Degrees Celsius)	1.00000	2.04722 \pm 2.37208
Temp10_OCTmax (Degrees Celsius)	4.66667	6.88889 \pm 2.71577
Temp10_OCTmin (Degrees Celsius)	-2.00000	-1.46111 \pm 1.64316
Temp11_NOVmax (Degrees Celsius)	-2.33333	-0.79722 \pm 2.43512
Temp11_NOVmin (Degrees Celsius)	-7.66667	-6.68056 \pm 2.97163
Temp12_DECmax (Degrees Celsius)	-6.00000	-4.66389 \pm 2.69757
Temp12_DECmin (Degrees Celsius)	-11.33333	-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)	-3.00000	-2.18056 \pm 2.41152
Hydrology		
Drainage-Area (km ²)	206.92152	124.42081 \pm 200.99192
Perimeter (Km)	106.80313	64.71360 \pm 56.15436
StreamDensity (m/km ²)	2563.19931	2246.06682 \pm 604.89962
StreamLength (m)	530381.11	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 (%)	6.65234	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 (%)	0.24997	0.64845 \pm 0.37668
Natl-ConiferousOpen (%)	47.03720	54.62780 \pm 18.30692
Natl-ConiferousSparse (%)	1.22092	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 (%)	14.90981	13.20054 \pm 11.11850
Natl-Grassland (%)	1.67628	1.87556 \pm 1.68508
Natl-Herb (%)	8.89573	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 (%)	0.04756	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 (%)	0.10476	1.56403 \pm 2.75979
Natl-Shrubland (%)	0.00000	0.00000 \pm 0.00000
Natl-ShrubLow (%)	1.15959	4.98298 \pm 3.22579
Natl-ShrubTall (%)	0.00000	0.00000 \pm 0.00000
Natl-SnowIce (%)	0.54066	0.08491 \pm 0.15475
Natl-Water (%)	0.04505	0.22916 \pm 0.36834
Natl-Wetland (%)	0.00000	0.00000 \pm 0.00000
Natl-WetlandHerb (%)	0.00787	0.12918 \pm 0.35193

Habitat Description

Variable	NJCAR01	Predicted Group Reference Mean \pm SD
Natl-WetlandShrub (%)	0.00367	0.00000 \pm 0.00000
Natl-WetlandTreed (%)	0.01164	0.00000 \pm 0.00000
Reg-Ice (%)	0.00300	0.02487 \pm 0.06034
Substrate Data		
%Bedrock (%)	0	0 \pm 0
%Boulder (%)	0	9 \pm 9
%Cobble (%)	71	51 \pm 15
%Gravel (%)	7	3 \pm 3
%Pebble (%)	22	37 \pm 20
%Sand (%)	0	0 \pm 0
%Silt+Clay (%)	0	0 \pm 0
D50 (cm)	8.00	15.12 \pm 14.26
Dg (cm)	6.9	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
SurroundingMaterial (Category(0-9))	4	4 \pm 1
Topography		
ElevationMax (m)	2750.00000	2634.66667 \pm 309.54023
ElevationMin (m)	567.00000	913.41667 \pm 271.25180
ElevationStdev (m)	411.24003	349.02363 \pm 92.12445
Reg-SlopeLT30% (%)	20.21000	18.88386 \pm 9.29866
Slope30-50% (%)	26.17314	29.00215 \pm 6.33837
Slope50-60% (%)	16.88413	13.91808 \pm 1.91315
SlopeAvg (%)	58.49565	52.79851 \pm 8.68755
SlopeGT60% (%)	44.66493	35.47207 \pm 13.39684
SlopeLT30% (%)	12.27780	21.60770 \pm 8.54172
SlopeMax (%)	382.74637	298.94390 \pm 146.30679
SlopeMin (%)	0.00000	0.19777 \pm 0.29213
SlopeStdev (%)	25.57601	26.57529 \pm 4.62351
Water Chemistry		
Ca (mg/L)	28.0000000	21.1083333 \pm 16.8005659
General-Conductivity (μ S/cm)	191.0000000	121.8083333 \pm 87.6800844
General-DO (mg/L)	10.0000000	11.4175000 \pm 0.7986708
General-Hardness (mg/L)	95.2000000	84.2750000 \pm 70.6251066
General-SpCond (μ S/cm)	191.0000000	168.9833333 \pm 123.7858182
General-Turbidity (NTU)	0.4500000	0.2020000
Mg (mg/L)	6.1200000	7.6666667 \pm 7.9748848
Nitrogen-TN (mg/L)	0.0800000	0.0883333 \pm 0.0521943

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Overall Model Error Rate	26.4%					
Probability of Group Membership	11.9%	2.5%	10.8%	62.5%	12.4%	
CABIN Assessment of NJCAR01 on Oct 22, 2013	Mildly Divergent					

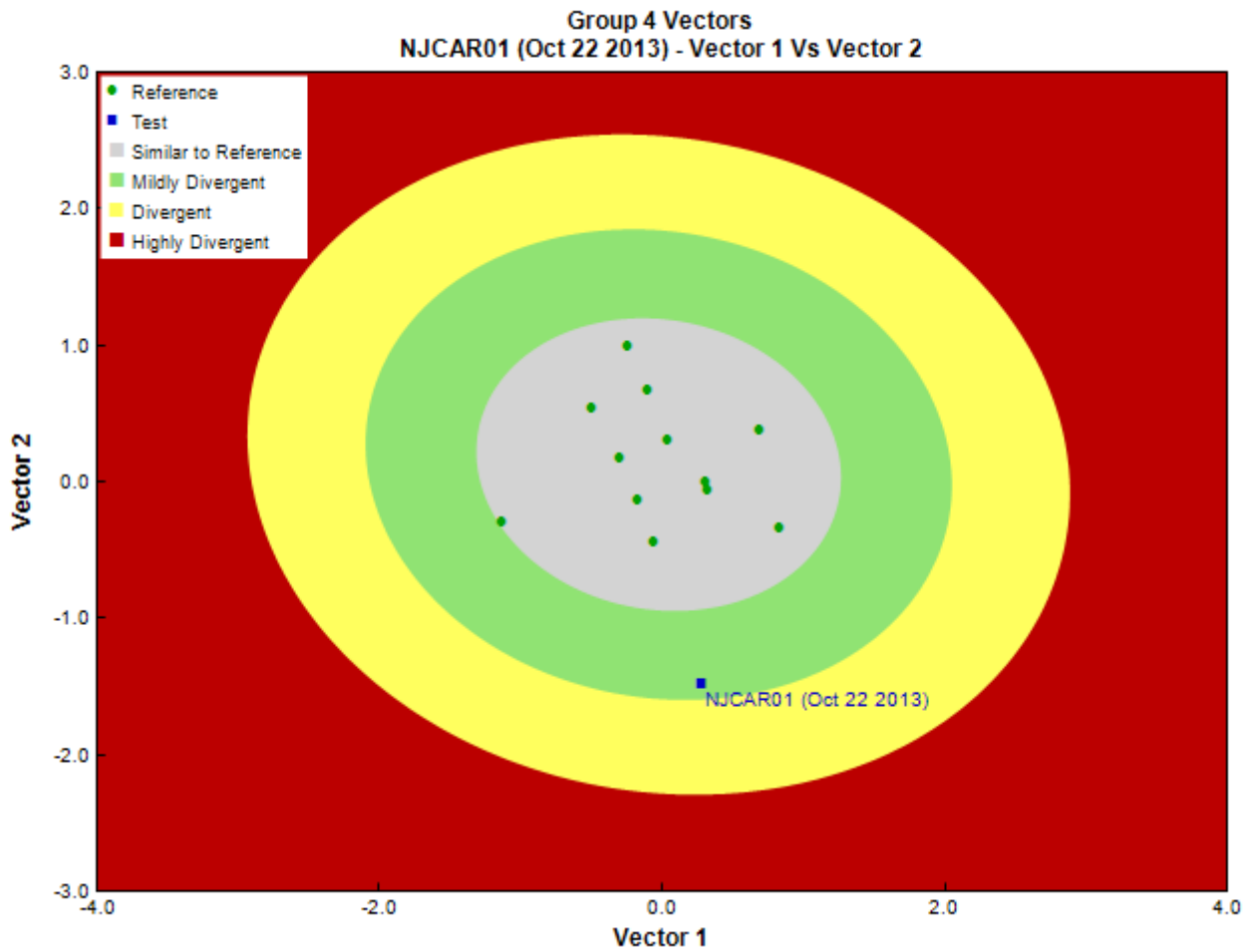


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Sample Information

Sampling Device	Kick Net
Mesh Size	400
Sampling Time	3
Taxonomist	Pina Viola, Consultant
Date Taxonomy Completed	March 19, 2014
	Marchant Box
Sub-Sample Proportion	18/100

Community Structure

Phylum	Class	Order	Family	Raw Count	Total Count
Annelida	Oligochaeta	Lumbriculida	Lumbriculidae	2	11.1
Arthropoda	Arachnida	Trombidiformes	Sperchontidae	2	11.1
		Insecta	Coleoptera	Elmidae	1
	Diptera		Chironomidae	14	77.8
			Psychodidae	1	5.6
			Simuliidae	1	5.6
		Ephemeroptera	Ameletidae	2	11.1
			Baetidae	12	66.7
			Ephemerellidae	4	22.2
			Heptageniidae	7	39.0
		Plecoptera		14	77.8
			Capniidae	2	11.1
			Chloroperlidae	6	33.3
			Leuctridae	1	5.6
			Nemouridae	13	72.2

Community Structure

Phylum	Class	Order	Family	Raw Count	Total Count
			Perlodidae	1	5.6
			Taeniopterygidae	229	1,272.2
		Trichoptera	Glossosomatidae	3	16.7
			Hydropsychidae	1	5.6
			Hydroptilidae	1	5.6
			Lepidostomatidae	2	11.1
			Rhyacophilidae	2	11.1
			Uenoidae	1	5.6
			Total	322	1,789.3

Metrics

Name	NJCAR01	Predicted Group Reference Mean \pm SD
Bray-Curtis Distance	0.7	0.4 \pm 0.1
Biotic Indices		
Hilsenhoff Family index (North-West)	2.3	3.2 \pm 0.3
Intolerant taxa	--	
Long-lived taxa	1.0	2.1 \pm 1.0
Tolerant individuals (%)	--	0.8 \pm 0.3
Functional Measures		
% Filterers	0.6	2.2 \pm 1.8
% Gatherers	85.1	38.4 \pm 12.4
% Predatores	8.4	19.0 \pm 8.5
% Scrapers	81.1	63.2 \pm 19.7
% Shredder	77.0	27.6 \pm 15.2
No. Clinger Taxa	22.0	23.2 \pm 6.3
Number Of Individuals		
% Chironomidae	4.5	7.4 \pm 6.4
% Coleoptera	0.3	1.5 \pm 3.9
% Diptera + Non-insects	6.5	10.8 \pm 7.6
% Ephemeroptera	8.1	51.7 \pm 18.8
% Ephemeroptera that are Baetidae	48.0	40.6 \pm 30.0
% EPT Individuals	93.2	87.7 \pm 7.4
% Odonata	0.0	0.0 \pm 0.0
% of 2 dominant taxa	78.9	57.9 \pm 14.2
% of 5 dominant taxa	89.3	81.6 \pm 7.9
% of dominant taxa	74.4	39.8 \pm 14.9
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Richness		
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Simpson's Diversity	0.4	0.8 \pm 0.1
Simpson's Evenness	0.1	0.3 \pm 0.1
Total No. of Taxa	22.0	19.3 \pm 3.7
Trichoptera taxa	6.0	3.2 \pm 1.4

Frequency and Probability of Taxa Occurrence

Reference Model Taxa	Frequency of Occurrence in Reference Sites					Probability Of Occurrence at NJCAR01
	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%	0.96
Ephemerellidae	78%	100%	100%	100%	100%	0.97
Heptageniidae	100%	100%	100%	100%	100%	1.00
Hydropsychidae	11%	92%	78%	92%	86%	0.80
Nemouridae	100%	100%	100%	100%	100%	1.00
Perlodidae	78%	78%	89%	92%	81%	0.88
Rhyacophilidae	100%	92%	100%	100%	95%	0.99
Taeniopterygidae	89%	49%	100%	92%	97%	0.92

RIVPACS Ratios

RIVPACS : Expected taxa P>0.50	13.85
RIVPACS : Observed taxa P>0.50	13.00
RIVPACS : O:E (p > 0.5)	0.94
RIVPACS : Expected taxa P>0.70	10.34
RIVPACS : Observed taxa P>0.70	11.00
RIVPACS : O:E (p > 0.7)	1.06

Habitat Description

Variable	NJCAR01	Predicted Group Reference Mean \pm SD
Bedrock Geology		
Alluvium (%)	0.00000	0.00000 \pm 0.00000
Intrusive (%)	11.20805	11.07346 \pm 28.63466
Metamorphic (%)	12.95645	17.96649 \pm 35.53463
Sedimentary (%)	75.83549	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)	46.4	23.6 \pm 11.1
Depth-BankfullMinusWetted (cm)	300.00	51.38 \pm 29.42
Depth-Max (cm)	55.5	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))	3	4 \pm 1
Reach-Pools (Binary)	1	1 \pm 0
Reach-Rapids (Binary)	1	0 \pm 0
Reach-Riffles (Binary)	1	1 \pm 0
Reach-StraightRun (Binary)	1	1 \pm 1
Slope (m/m)	0.2200000	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)	1.01	0.48 \pm 0.22
Velocity-Max (m/s)	1.25	0.76 \pm 0.36
Width-Bankfull (m)	52.0	13.4 \pm 9.9
Width-Wetted (m)	15.0	8.5 \pm 5.8
XSEC-VelMethod (Category (1-3))	1	1 \pm 0
Climate		
Precip01_JAN (mm)	141.66667	104.85000 \pm 26.28129
Precip02_FEB (mm)	117.00000	83.66667 \pm 27.10278
Precip03_MAR (mm)	104.33333	77.23611 \pm 27.15950
Precip04_APR (mm)	141.66667	104.85000 \pm 26.28129
Precip05_MAY (mm)	81.00000	71.65833 \pm 17.81753
Precip06_JUN (mm)	92.00000	78.56667 \pm 15.58521
Precip07_JUL (mm)	77.00000	64.39167 \pm 10.41611
Precip08_AUG (mm)	74.00000	60.53056 \pm 10.43373

Habitat Description

Variable	NJCAR01	Predicted Group Reference Mean \pm SD
Precip09_SEP (mm)	70.00000	56.91944 \pm 10.91783
Precip10_OCT (mm)	87.33333	65.08056 \pm 14.41229
Precip11_NOV (mm)	140.66667	105.93889 \pm 25.04104
Precip12_DEC (mm)	156.33333	116.84444 \pm 29.80954
PrecipTotal_ANNUAL (mm)	1221.66667	952.64722 \pm 226.04690
Temp01_JANMax (Degrees Celsius)	-5.66667	-4.39167 \pm 2.51268
Temp01_JANmin (Degrees Celsius)	-12.00000	-11.40833 \pm 3.53951
Temp02_FEBmax (Degrees Celsius)	-2.66667	-1.70000 \pm 2.12945
Temp02_FEBmin (Degrees Celsius)	-10.00000	-9.17500 \pm 3.33361
Temp03_MARmax (Degrees Celsius)	0.33333	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)	-3.33333	-2.71667 \pm 2.22785
Temp05_MAYmax (Degrees Celsius)	9.66667	12.03889 \pm 3.55434
Temp05_MAYmin (Degrees Celsius)	0.33333	1.04722 \pm 2.08663
Temp06_JUNMax (Degrees Celsius)	13.33333	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)	5.00000	6.35833 \pm 2.28332
Temp08_AUGmax (Degrees Celsius)	17.00000	19.52222 \pm 3.51100
Temp08_AUGmin (Degrees Celsius)	5.00000	6.19167 \pm 2.34422
Temp09_SEPmax (Degrees Celsius)	12.00000	14.04444 \pm 3.03456
Temp09_SEPmin (Degrees Celsius)	1.00000	2.04722 \pm 2.37208
Temp10_OCTmax (Degrees Celsius)	4.66667	6.88889 \pm 2.71577
Temp10_OCTmin (Degrees Celsius)	-2.00000	-1.46111 \pm 1.64316
Temp11_NOVmax (Degrees Celsius)	-2.33333	-0.79722 \pm 2.43512
Temp11_NOVmin (Degrees Celsius)	-7.66667	-6.68056 \pm 2.97163
Temp12_DECmax (Degrees Celsius)	-6.00000	-4.66389 \pm 2.69757
Temp12_DECmin (Degrees Celsius)	-11.33333	-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)	-3.00000	-2.18056 \pm 2.41152
Hydrology		
Drainage-Area (km ²)	206.92152	124.42081 \pm 200.99192
Perimeter (Km)	106.80313	64.71360 \pm 56.15436
StreamDensity (m/km ²)	2563.19931	2246.06682 \pm 604.89962
StreamLength (m)	530381.11	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 (%)	6.65234	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 (%)	0.24997	0.64845 \pm 0.37668
Natl-ConiferousOpen (%)	47.03720	54.62780 \pm 18.30692
Natl-ConiferousSparse (%)	1.22092	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 (%)	14.90981	13.20054 \pm 11.11850
Natl-Grassland (%)	1.67628	1.87556 \pm 1.68508
Natl-Herb (%)	8.89573	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 (%)	0.04756	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 (%)	0.10476	1.56403 \pm 2.75979
Natl-Shrubland (%)	0.00000	0.00000 \pm 0.00000
Natl-ShrubLow (%)	1.15959	4.98298 \pm 3.22579
Natl-ShrubTall (%)	0.00000	0.00000 \pm 0.00000
Natl-SnowIce (%)	0.54066	0.08491 \pm 0.15475

Habitat Description

Variable	NJCAR01	Predicted Group Reference Mean \pm SD
Natl-Water (%)	0.04505	0.22916 \pm 0.36834
Natl-Wetland (%)	0.00000	0.00000 \pm 0.00000
Natl-WetlandHerb (%)	0.00787	0.12918 \pm 0.35193
Natl-WetlandShrub (%)	0.00367	0.00000 \pm 0.00000
Natl-WetlandTreed (%)	0.01164	0.00000 \pm 0.00000
Reg-Ice (%)	0.00300	0.02487 \pm 0.06034
Substrate Data		
%Bedrock (%)	0	0 \pm 0
%Boulder (%)	9	9 \pm 9
%Cobble (%)	69	51 \pm 15
%Gravel (%)	0	3 \pm 3
%Pebble (%)	22	37 \pm 20
%Sand (%)	0	0 \pm 0
%Silt+Clay (%)	0	0 \pm 0
D50 (cm)	10.10	15.12 \pm 14.26
Dg (cm)	10.3	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))	4	1 \pm 0
Topography		
ElevationMax (m)	2750.00000	2634.66667 \pm 309.54023
ElevationMin (m)	567.00000	913.41667 \pm 271.25180
ElevationStdev (m)	411.24003	349.02363 \pm 92.12445
Reg-SlopeLT30% (%)	20.21000	18.88386 \pm 9.29866
Slope30-50% (%)	26.17314	29.00215 \pm 6.33837
Slope50-60% (%)	16.88413	13.91808 \pm 1.91315
SlopeAvg (%)	58.49565	52.79851 \pm 8.68755
SlopeGT60% (%)	44.66493	35.47207 \pm 13.39684
SlopeLT30% (%)	12.27780	21.60770 \pm 8.54172
SlopeMax (%)	382.74637	298.94390 \pm 146.30679
SlopeMin (%)	0.00000	0.19777 \pm 0.29213
SlopeStdev (%)	25.57601	26.57529 \pm 4.62351
Water Chemistry		
General-DO (mg/L)	14.0000000	11.4175000 \pm 0.7986708
General-pH (pH)	7.9	7.9 \pm 0.4
General-SpCond (μ S/cm)	194.7000000	168.9833333 \pm 123.7858182
General-TempAir (Degrees Celsius)	10.0	26.0
General-TempWater (Degrees Celsius)	5.0000000	7.3183333 \pm 2.7240839
General-Turbidity (NTU)	1.8600000	0.2020000

Site Description

Study Name	CBWQ-Slocan
Site	NJCAR01
Sampling Date	Sep 18 2014
Know Your Watershed Basin	Slocan
Province / Territory	British Columbia
Terrestrial Ecological Classification	Montane Cordillera EcoZone Columbia Mountains and Highlands EcoRegion
Coordinates (decimal degrees)	49.99306 N, 117.37389 W
Altitude	566
Local Basin Name	Carpenter Creek
	Slocan
Stream Order	4



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	September 05, 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	2.3%	3.3%	12.4%	66.7%	15.2%	
CABIN Assessment of NJCAR01 on Sep 18, 2014	Similar to Reference					

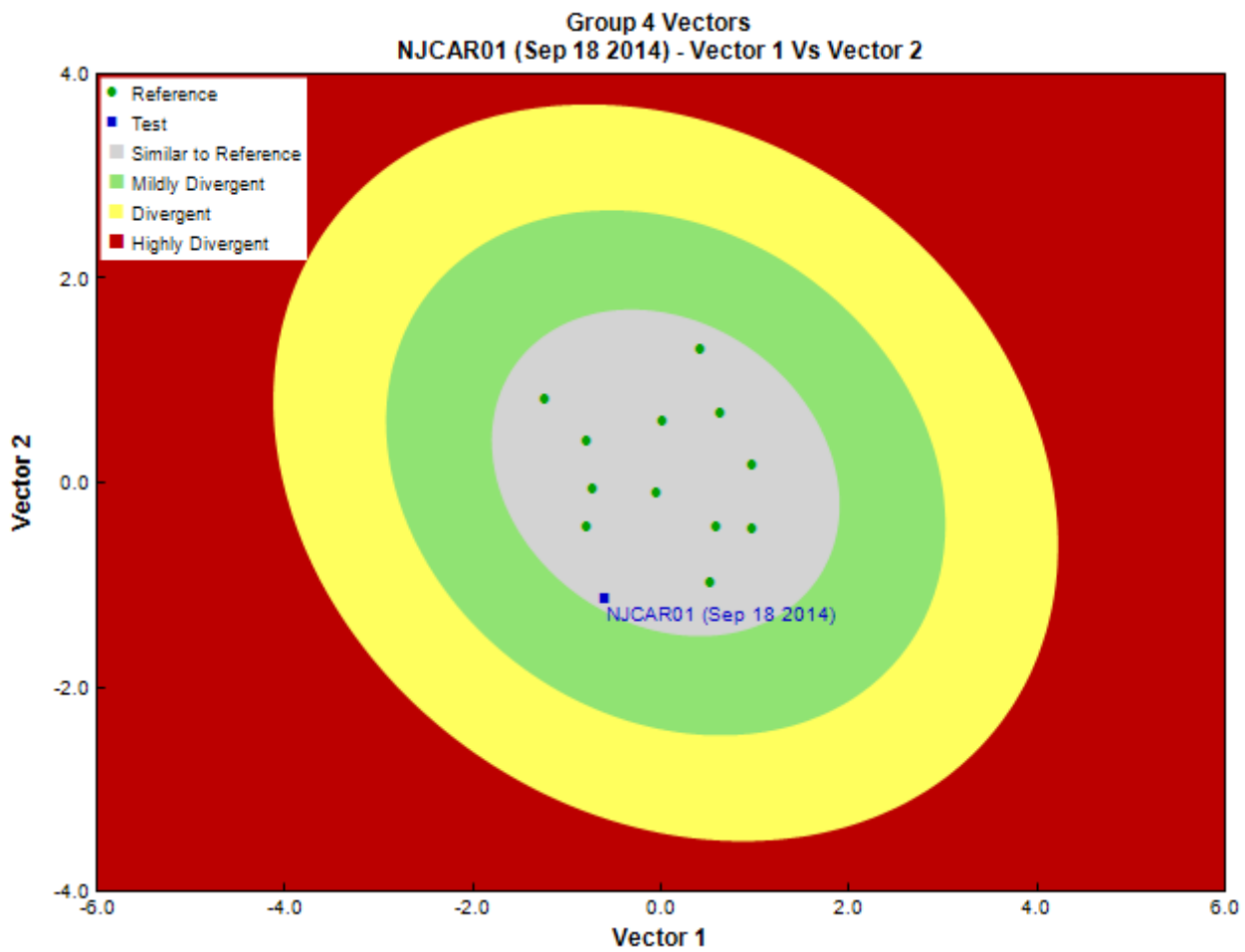


Figure 3. CABIN ordination assessment of the test site with the predicted group of reference sites. Each axis represents the relative abundance of the entire benthic invertebrate community with different organisms weighted differently on each axis.

Sample Information

Sampling Device	Kick Net
Mesh Size	400
Sampling Time	3
Taxonomist	Pina Viola, Consultant
Date Taxonomy Completed	January 21, 2015
	Marchant Box
Sub-Sample Proportion	32/100

Community Structure

Phylum	Class	Order	Family	Raw Count	Total Count
Annelida	Oligochaeta			1	3.1
Arthropoda	Arachnida	Trombidiformes	Sperchontidae	5	15.6
	Insecta	Diptera	Chironomidae	24	75.0
Empididae			3	9.4	
Tipulidae			1	3.1	
Ephemeroptera		Ameletidae	1	3.1	
		Baetidae	27	84.4	
		Ephemerellidae	5	15.7	
		Heptageniidae	18	56.3	
Plecoptera		Chloroperlidae	4	12.6	
		Leuctridae	2	6.3	
		Nemouridae	9	28.2	
		Perlodidae	8	25.0	
		Taeniopterygidae	195	609.4	
Trichoptera			Glossosomatidae	9	28.1

Community Structure

Phylum	Class	Order	Family	Raw Count	Total Count
			Limnephilidae	2	6.3
			Rhyacophilidae	2	6.3
			Uenoidae	3	9.4
			Total	319	997.3

Metrics

Name	NJCAR01	Predicted Group Reference Mean \pm SD
Bray-Curtis Distance	0.56	0.4 \pm 0.1
Biotic Indices		
Hilsenhoff Family index (North-West)	2.5	3.2 \pm 0.3
Intolerant taxa	--	
Long-lived taxa	--	2.1 \pm 1.0
Tolerant individuals (%)	--	0.8 \pm 0.3
Functional Measures		
% Filterers	--	2.2 \pm 1.8
% Gatherers	75.9	38.4 \pm 12.4
% Predatores	14.4	19.0 \pm 8.5
% Scrapers	80.9	63.2 \pm 19.7
% Shredder	65.5	27.6 \pm 15.2
No. Clinger Taxa	18.0	23.2 \pm 6.3
Number Of Individuals		
% Chironomidae	7.5	7.4 \pm 6.4
% Coleoptera	0.0	1.5 \pm 3.9
% Diptera + Non-insects	10.4	10.8 \pm 7.6
% Ephemeroptera	16.0	51.7 \pm 18.8
% Ephemeroptera that are Baetidae	52.9	40.6 \pm 30.0
% EPT Individuals	89.6	87.7 \pm 7.4
% Odonata	0.0	0.0 \pm 0.0
% of 2 dominant taxa	69.8	57.9 \pm 14.2
% of 5 dominant taxa	85.9	81.6 \pm 7.9
% of dominant taxa	61.3	39.8 \pm 14.9
% Plecoptera	68.6	31.4 \pm 15.4
% Tribe Tanyatarisini	--	
% Trichoptera that are Hydropsychida	0.0	27.0 \pm 26.2
% Tricoptera	5.0	4.5 \pm 2.8
No. EPT individuals/Chironomids+EPT Individuals	0.9	0.9 \pm 0.1
Total Abundance	996.8	587.4 \pm 299.1
Richness		
Chironomidae taxa (genus level only)	1.0	1.0 \pm 0.0
Coleoptera taxa	0.0	0.4 \pm 0.5
Diptera taxa	3.0	3.3 \pm 1.0
Ephemeroptera taxa	4.0	3.8 \pm 0.8
EPT Individuals (Sum)	890.6	526.0 \pm 285.8
EPT taxa (no)	13.0	13.3 \pm 2.7
Odonata taxa	0.0	0.0 \pm 0.0
Pielou's Evenness	0.6	0.7 \pm 0.1
Plecoptera taxa	5.0	6.3 \pm 1.1
Shannon-Wiener Diversity	1.6	1.9 \pm 0.4
Simpson's Diversity	0.6	0.8 \pm 0.1
Simpson's Evenness	0.1	0.3 \pm 0.1
Total No. of Taxa	17.0	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 NJCAR01
	Group 1	Group 2	Group 3	Group 4	Group 5	
Baetidae	100%	100%	100%	100%	97%	1.00
Capniidae	78%	55%	50%	92%	68%	0.81
Chironomidae	100%	100%	100%	100%	95%	0.99
Chloroperlidae	78%	88%	94%	100%	100%	0.98

Frequency and Probability of Taxa Occurrence

Reference Model Taxa	Frequency of Occurrence in Reference Sites					Probability Of Occurrence at NJCAR01
	Group 1	Group 2	Group 3	Group 4	Group 5	
EphemereIIDae	78%	100%	100%	100%	100%	0.99
Heptageniidae	100%	100%	100%	100%	100%	1.00
Hydropsychidae	11%	92%	78%	92%	86%	0.87
Nemouridae	100%	100%	100%	100%	100%	1.00
Perlidae	11%	84%	33%	100%	3%	0.74
Perlodidae	78%	78%	89%	92%	81%	0.89
Rhyacophilidae	100%	92%	100%	100%	95%	0.99
Taeniopterygidae	89%	49%	100%	92%	97%	0.92

RIVPACS Ratios

RIVPACS : Expected taxa P>0.50	13.01
RIVPACS : Observed taxa P>0.50	12.00
RIVPACS : O:E (p > 0.5)	0.92
RIVPACS : Expected taxa P>0.70	11.19
RIVPACS : Observed taxa P>0.70	9.00
RIVPACS : O:E (p > 0.7)	0.80

Habitat Description

Variable	NJCAR01	Predicted Group Reference Mean \pm SD
Bedrock Geology		
Alluvium (%)	0.00000	0.00000 \pm 0.00000
Intrusive (%)	11.20805	11.07346 \pm 28.63466
Metamorphic (%)	12.95645	17.96649 \pm 35.53463
Sedimentary (%)	75.83549	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)	36.0	23.6 \pm 11.1
Depth-BankfullMinusWetted (cm)	121.50	51.38 \pm 29.42
Depth-Max (cm)	48.0	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))	3	4 \pm 1
Reach-Pools (Binary)	1	1 \pm 0
Reach-Rapids (Binary)	1	0 \pm 0
Reach-Riffles (Binary)	1	1 \pm 0
Reach-StraightRun (Binary)	0	1 \pm 1
Slope (m/m)	0.2200000	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)	0.67	0.48 \pm 0.22
Velocity-Max (m/s)	0.89	0.76 \pm 0.36
Width-Bankfull (m)	52.0	13.4 \pm 9.9
Width-Wetted (m)	13.7	8.5 \pm 5.8
XSEC-VelMethod (Category (1-3))	1	1 \pm 0
Climate		
Precip01_JAN (mm)	141.66667	104.85000 \pm 26.28129
Precip02_FEB (mm)	117.00000	83.66667 \pm 27.10278
Precip03_MAR (mm)	104.33333	77.23611 \pm 27.15950
Precip04_APR (mm)	141.66667	104.85000 \pm 26.28129
Precip05_MAY (mm)	81.00000	71.65833 \pm 17.81753
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Precip07_JUL (mm)	77.00000	64.39167 \pm 10.41611
Precip08_AUG (mm)	74.00000	60.53056 \pm 10.43373
Precip09_SEP (mm)	70.00000	56.91944 \pm 10.91783
Precip10_OCT (mm)	87.33333	65.08056 \pm 14.41229
Precip11_NOV (mm)	140.66667	105.93889 \pm 25.04104

Habitat Description

Variable	NJCAR01	Predicted Group Reference Mean \pm SD
Precip12_DEC (mm)	156.33333	116.84444 \pm 29.80954
PrecipTotal_ANNUAL (mm)	1221.66667	952.64722 \pm 226.04690
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Temp03_MARmin (Degrees Celsius)	-7.00000	-6.14167 \pm 2.98556
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Temp06_JUNMin (Degrees Celsius)	3.00000	4.00278 \pm 2.41085
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Temp07_JULmin (Degrees Celsius)	5.00000	6.35833 \pm 2.28332
Temp08_AUGmax (Degrees Celsius)	17.00000	19.52222 \pm 3.51100
Temp08_AUGmin (Degrees Celsius)	5.00000	6.19167 \pm 2.34422
Temp09_SEPmax (Degrees Celsius)	12.00000	14.04444 \pm 3.03456
Temp09_SEPmin (Degrees Celsius)	1.00000	2.04722 \pm 2.37208
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StreamLength (m)	530381.11	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 (%)	6.65234	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 (%)	0.24997	0.64845 \pm 0.37668
Natl-ConiferousOpen (%)	47.03720	54.62780 \pm 18.30692
Natl-ConiferousSparse (%)	1.22092	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 (%)	14.90981	13.20054 \pm 11.11850
Natl-Grassland (%)	1.67628	1.87556 \pm 1.68508
Natl-Herb (%)	8.89573	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 (%)	0.04756	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 (%)	0.10476	1.56403 \pm 2.75979
Natl-Shrubland (%)	0.00000	0.00000 \pm 0.00000
Natl-ShrubLow (%)	1.15959	4.98298 \pm 3.22579
Natl-ShrubTall (%)	0.00000	0.00000 \pm 0.00000
Natl-SnowIce (%)	0.54066	0.08491 \pm 0.15475
Natl-Water (%)	0.04505	0.22916 \pm 0.36834
Natl-Wetland (%)	0.00000	0.00000 \pm 0.00000
Natl-WetlandHerb (%)	0.00787	0.12918 \pm 0.35193

Habitat Description

Variable	NJCAR01	Predicted Group Reference Mean \pm SD
Natl-WetlandShrub (%)	0.00367	0.00000 \pm 0.00000
Natl-WetlandTreed (%)	0.01164	0.00000 \pm 0.00000
Reg-Ice (%)	0.00300	0.02487 \pm 0.06034
Substrate Data		
%Bedrock (%)	0	0 \pm 0
%Boulder (%)	10	9 \pm 9
%Cobble (%)	75	51 \pm 15
%Gravel (%)	1	3 \pm 3
%Pebble (%)	14	37 \pm 20
%Sand (%)	0	0 \pm 0
%Silt+Clay (%)	0	0 \pm 0
D50 (cm)	11.00	15.12 \pm 14.26
Dg (cm)	11.2	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))	2	1 \pm 0
Topography		
ElevationMax (m)	2750.00000	2634.66667 \pm 309.54023
ElevationMin (m)	567.00000	913.41667 \pm 271.25180
ElevationStdev (m)	411.24003	349.02363 \pm 92.12445
Reg-SlopeLT30% (%)	20.21000	18.88386 \pm 9.29866
Slope30-50% (%)	26.17314	29.00215 \pm 6.33837
Slope50-60% (%)	16.88413	13.91808 \pm 1.91315
SlopeAvg (%)	58.49565	52.79851 \pm 8.68755
SlopeGT60% (%)	44.66493	35.47207 \pm 13.39684
SlopeLT30% (%)	12.27780	21.60770 \pm 8.54172
SlopeMax (%)	382.74637	298.94390 \pm 146.30679
SlopeMin (%)	0.00000	0.19777 \pm 0.29213
SlopeStdev (%)	25.57601	26.57529 \pm 4.62351
Water Chemistry		
CO3 (mg/L)	0.2500000	0.0000000 \pm 0.0000000
General-Alkalinity (mg/L)	69.7000000	71.7000000 \pm 53.9231440
General-DO (mg/L)	11.0000000	11.4175000 \pm 0.7986708
General-pH (pH)	8.1	7.9 \pm 0.4
General-SpCond (μ S/cm)	207.9000000	168.9833333 \pm 123.7858182
General-TempAir (Degrees Celsius)	16.0	26.0
General-TempWater (Degrees Celsius)	10.0000000	7.3183333 \pm 2.7240839
General-Turbidity (NTU)	0.3500000	0.2020000
HCO3 (mg/L)	85.0000000	0.0000000 \pm 0.0000000
Nitrogen-NO2 (mg/L)	0.0025000	0.0027500 \pm 0.0062831
Nitrogen-NO2+NO3 (mg/L)	0.0470000	0.0690000
Nitrogen-NO3 (mg/L)	0.0470000	0.0546667 \pm 0.0498148
Phosphorus-OrthoP (mg/L)	0.0025000	0.0002727 \pm 0.0004671
Phosphorus-TP (mg/L)	0.0070000	0.0045833 \pm 0.0049992