

**Site Description**

<b>Study Name</b>	CBWQ-Windermere
<b>Site</b>	NAWIN01
<b>Sampling Date</b>	Sep 18 2014
<b>Know Your Watershed Basin</b>	Upper Columbia
<b>Province / Territory</b>	British Columbia
<b>Terrestrial Ecological Classification</b>	Montane Cordillera EcoZone Western Continental Ranges EcoRegion
<b>Coordinates (decimal degrees)</b>	50.47272 N, 115.84039 W
<b>Altitude</b>	4327
<b>Local Basin Name</b>	Windermere Creek
	Windermere Creek
<b>Stream Order</b>	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**

		<b>Reference Model Summary</b>				
<b>Model</b>	Columbia-Okanagan Preliminary March 2010					
<b>Analysis Date</b>	November 07, 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>	0.0%	0.1%	31.4%	29.0%	39.5%	
<b>CABIN Assessment of NAWIN01 on Sep 18, 2014</b>	Similar to Reference					

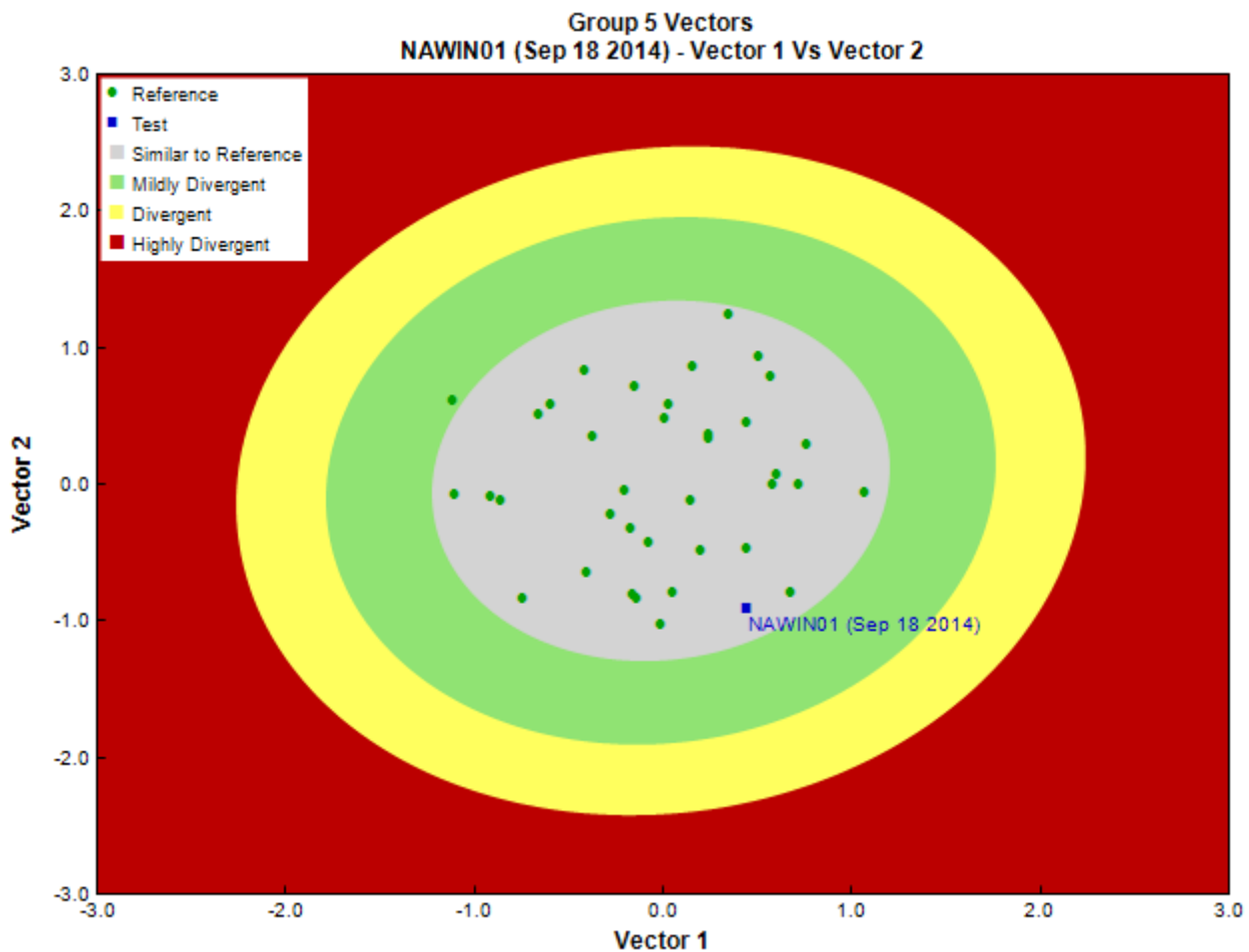


Figure 3. CABIN ordination assessment of the test site with the predicted group of reference sites. Each axis represents the relative abundance of the entire benthic invertebrate community with different organisms weighted differently on each axis.

**Sample Information**

<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>	November 14, 2014
	Marchant Box
<b>Sub-Sample Proportion</b>	22/100

**Community Structure**

Phylum	Class	Order	Family	Raw Count	Total Count
Annelida	Oligochaeta	Enchytraeida	Enchytraeidae	7	31.8
		Tubificida		1	4.5
Arthropoda	Insecta	Coleoptera	Curculionidae	1	4.5
			Diptera	Chironomidae	56
			Empididae	1	4.5
			Tipulidae	3	13.6
		Ephemeroptera	Ameletidae	7	31.8
			Baetidae	10	45.4
			Ephemerellidae	6	27.3
			Heptageniidae	17	77.3
		Plecoptera	Capniidae	5	22.7
			Chloroperlidae	1	4.5
			Nemouridae	57	259.1
			Perlodidae	1	4.5
			Taeniopterygidae	144	654.5

## Community Structure

Phylum	Class	Order	Family	Raw Count	Total Count
		Trichoptera		1	4.5
			Hydropsychidae	1	4.5
			Limnephilidae	3	13.6
			Total	322	1,463.1

NAWIN04 2013 and 2014 - question of Group Placement. will run separate Reports

## Metrics

Name	NAWIN01	Predicted Group Reference Mean $\pm$ SD
<b>Bray-Curtis Distance</b>	0.46	0.4 $\pm$ 0.1
<b>Biotic Indices</b>		
<b>Hilsenhoff Family index (North-West)</b>	3.1	2.8 $\pm$ 0.3
<b>Intolerant taxa</b>	--	1.0 $\pm$ 0.0
<b>Long-lived taxa</b>	--	1.0 $\pm$ 0.0
<b>Tolerant individuals (%)</b>	--	0.3
<b>Functional Measures</b>		
<b>% Filterers</b>	0.3	1.7 $\pm$ 1.7
<b>% Gatherers</b>	87.3	50.6 $\pm$ 14.6
<b>% Predatores</b>	18.6	15.3 $\pm$ 9.0
<b>% Scrapers</b>	54.3	67.2 $\pm$ 16.8
<b>% Shredder</b>	66.1	38.1 $\pm$ 18.2
<b>No. Clinger Taxa</b>	14.0	19.8 $\pm$ 3.4
<b>Number Of Individuals</b>		
<b>% Chironomidae</b>	17.5	4.6 $\pm$ 5.0
<b>% Coleoptera</b>	0.3	0.0 $\pm$ 0.0
<b>% Diptera + Non-insects</b>	20.9	6.3 $\pm$ 5.3
<b>% Ephemeroptera</b>	12.5	44.9 $\pm$ 17.3
<b>% Ephemeroptera that are Baetidae</b>	25.0	26.1 $\pm$ 20.5
<b>% EPT Individuals</b>	78.7	93.7 $\pm$ 5.3
<b>% Odonata</b>	--	0.0 $\pm$ 0.0
<b>% of 2 dominant taxa</b>	62.8	60.2 $\pm$ 11.4
<b>% of 5 dominant taxa</b>	88.7	84.5 $\pm$ 5.9
<b>% of dominant taxa</b>	45.0	39.3 $\pm$ 12.3
<b>% Plecoptera</b>	65.0	42.9 $\pm$ 17.2
<b>% Tribe Tanyatarisini</b>	--	
<b>% Trichoptera that are Hydropsychida</b>	25.0	27.4 $\pm$ 27.1
<b>% Tricoptera</b>	1.3	5.8 $\pm$ 5.7
<b>No. EPT individuals/Chironomids+EPT Individuals</b>	0.8	1.0 $\pm$ 0.1
<b>Total Abundance</b>	1463.6	2163.6 $\pm$ 1274.4
<b>Richness</b>		
<b>Chironomidae taxa (genus level only)</b>	1.0	0.9 $\pm$ 0.2
<b>Coleoptera taxa</b>	1.0	0.1 $\pm$ 0.2
<b>Diptera taxa</b>	3.0	2.4 $\pm$ 1.0
<b>Ephemeroptera taxa</b>	4.0	3.7 $\pm$ 0.5
<b>EPT Individuals (Sum)</b>	1145.4	2023.9 $\pm$ 1195.7
<b>EPT taxa (no)</b>	11.0	12.3 $\pm$ 1.9
<b>Odonata taxa</b>	--	0.0 $\pm$ 0.0
<b>Pielou's Evenness</b>	0.6	0.7 $\pm$ 0.1
<b>Plecoptera taxa</b>	5.0	5.5 $\pm$ 1.1
<b>Shannon-Wiener Diversity</b>	1.7	1.9 $\pm$ 0.3
<b>Simpson's Diversity</b>	0.7	0.8 $\pm$ 0.1
<b>Simpson's Evenness</b>	0.2	0.3 $\pm$ 0.1
<b>Total No. of Taxa</b>	16.0	16.0 $\pm$ 3.0
<b>Trichoptera taxa</b>	2.0	3.2 $\pm$ 1.0

## Frequency and Probability of Taxa Occurrence

Reference Model Taxa	Frequency of Occurrence in Reference Sites					Probability Of Occurrence at NAWIN01
	Group 1	Group 2	Group 3	Group 4	Group 5	
Baetidae	100%	100%	100%	100%	97%	0.99

### Frequency and Probability of Taxa Occurrence

Reference Model Taxa	Frequency of Occurrence in Reference Sites					Probability Of Occurrence at NAWIN01
	Group 1	Group 2	Group 3	Group 4	Group 5	
Chironomidae	100%	100%	100%	100%	95%	0.98
Chloroperlidae	78%	88%	94%	100%	100%	0.98
EphemereIIDae	78%	100%	100%	100%	100%	1.00
Heptageniidae	100%	100%	100%	100%	100%	1.00
Hydropsychidae	11%	92%	78%	92%	86%	0.85
Nemouridae	100%	100%	100%	100%	100%	1.00
Perlodidae	78%	78%	89%	92%	81%	0.87
Rhyacophilidae	100%	92%	100%	100%	95%	0.98
Taeniopterygidae	89%	49%	100%	92%	97%	0.96

### RIVPACS Ratios

RIVPACS : Expected taxa P>0.50	11.99
RIVPACS : Observed taxa P>0.50	11.00
RIVPACS : O:E (p > 0.5)	0.92
RIVPACS : Expected taxa P>0.70	9.61
RIVPACS : Observed taxa P>0.70	9.00
RIVPACS : O:E (p > 0.7)	0.94

### Habitat Description

Variable	NAWIN01	Predicted Group Reference Mean $\pm$ SD
<b>Bedrock Geology</b>		
Alluvium (%)	0.00000	0.00000 $\pm$ 0.00000
Intrusive (%)	0.00000	0.46153 $\pm$ 2.09955
Metamorphic (%)	0.00000	0.17691 $\pm$ 0.85012
Sedimentary (%)	100.00000	99.36155 $\pm$ 2.22799
Ultramafic (%)	0.00000	0.00000 $\pm$ 0.00000
Volcanic (%)	0.00000	0.00000 $\pm$ 0.00000
<b>Channel</b>		
Depth-Avg (cm)	8.3	21.5 $\pm$ 9.7
Depth-BankfullMinusWetted (cm)	58.00	38.14 $\pm$ 36.11
Depth-Max (cm)	9.5	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)	0	1 $\pm$ 0
Reach-Rapids (Binary)	0	0 $\pm$ 0
Reach-Riffles (Binary)	1	1 $\pm$ 0
Reach-StraightRun (Binary)	0	0 $\pm$ 1
Slope (m/m)	0.0360000	0.0581357 $\pm$ 0.0554952
Veg-Coniferous (Binary)	0	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)	0.50	0.51 $\pm$ 0.27
Velocity-Max (m/s)	0.67	0.78 $\pm$ 0.40
Width-Bankfull (m)	3.4	13.7 $\pm$ 16.4
Width-Wetted (m)	1.1	9.0 $\pm$ 13.1
XSEC-VelMethod (Category (1-3))	1	2 $\pm$ 1
<b>Climate</b>		
Precip01_JAN (mm)	78.00000	130.45668 $\pm$ 67.17180
Precip02_FEB (mm)	63.00000	102.48242 $\pm$ 52.12836
Precip03_MAR (mm)	61.00000	89.80929 $\pm$ 42.79174
Precip04_APR (mm)	78.00000	135.11134 $\pm$ 66.06707
Precip05_MAY (mm)	63.00000	70.51109 $\pm$ 13.79432
Precip06_JUN (mm)	70.00000	86.65922 $\pm$ 19.93623
Precip07_JUL (mm)	64.00000	79.11475 $\pm$ 19.88523
Precip08_AUG (mm)	64.00000	76.86606 $\pm$ 21.34619
Precip09_SEP (mm)	52.00000	71.16784 $\pm$ 23.11306
Precip10_OCT (mm)	51.00000	88.14083 $\pm$ 44.84739

## Habitat Description

Variable	NAWIN01	Predicted Group Reference Mean $\pm$ SD
Precip11_NOV (mm)	83.00000	134.64587 $\pm$ 63.61897
Precip12_DEC (mm)	91.00000	142.32359 $\pm$ 65.85239
PrecipTotal_ANNUAL (mm)	795.00000	1143.02476 $\pm$ 453.62461
Temp01_JANMax (Degrees Celsius)	-6.00000	-6.18206 $\pm$ 1.69263
Temp01_JANmin (Degrees Celsius)	-16.00000	-13.62029 $\pm$ 2.05208
Temp02_FEBmax (Degrees Celsius)	-3.00000	-2.89816 $\pm$ 1.88421
Temp02_FEBmin (Degrees Celsius)	-13.00000	-11.14625 $\pm$ 1.99282
Temp03_MARmax (Degrees Celsius)	0.00000	0.98920 $\pm$ 2.35950
Temp03_MARmin (Degrees Celsius)	-9.00000	-7.98295 $\pm$ 1.94687
Temp04_APRmax (Degrees Celsius)	5.00000	5.37616 $\pm$ 3.02243
Temp04_APRmin (Degrees Celsius)	-5.00000	-3.74673 $\pm$ 1.66191
Temp05_MAYmax (Degrees Celsius)	10.00000	10.12548 $\pm$ 3.18022
Temp05_MAYmin (Degrees Celsius)	0.00000	0.09616 $\pm$ 1.15628
Temp06_JUNMax (Degrees Celsius)	14.00000	13.85415 $\pm$ 3.23839
Temp06_JUNMin (Degrees Celsius)	2.00000	2.79527 $\pm$ 1.60213
Temp07_JULmax (Degrees Celsius)	17.00000	17.45582 $\pm$ 3.27590
Temp07_JULmin (Degrees Celsius)	4.00000	4.99257 $\pm$ 1.52992
Temp08_AUGmax (Degrees Celsius)	17.00000	17.36896 $\pm$ 3.11866
Temp08_AUGmin (Degrees Celsius)	4.00000	4.84827 $\pm$ 1.46649
Temp09_SEPmax (Degrees Celsius)	12.00000	12.13974 $\pm$ 2.86510
Temp09_SEPmin (Degrees Celsius)	0.00000	1.12535 $\pm$ 1.20660
Temp10_OCTmax (Degrees Celsius)	6.00000	5.04078 $\pm$ 2.46521
Temp10_OCTmin (Degrees Celsius)	-3.00000	-2.41023 $\pm$ 1.18961
Temp11_NOVmax (Degrees Celsius)	-3.00000	-2.24818 $\pm$ 1.93047
Temp11_NOVmin (Degrees Celsius)	-10.00000	-8.35137 $\pm$ 1.96467
Temp12_DECmax (Degrees Celsius)	-7.00000	-6.49458 $\pm$ 1.76429
Temp12_DECmin (Degrees Celsius)	-15.00000	-12.72330 $\pm$ 1.87798
TempANNUALmax (Degrees Celsius)	5.00000	5.16639 $\pm$ 2.57569
TempANNUALmean (Degrees Celsius)	0.00000	0.71683 $\pm$ 1.81248
TempANNUALmin (Degrees Celsius)	-5.00000	-3.38604 $\pm$ 1.60598
<b>Hydrology</b>		
Drainage-Area (km <sup>2</sup> )	1.92955	135.66658 $\pm$ 373.96803
Perimeter (Km)	8.58990	55.78285 $\pm$ 83.00734
StreamDensity (m/km <sup>2</sup> )	1879.81859	2198.74079 $\pm$ 886.68339
StreamLength (m)	3627.20	293250.33 $\pm$ 851854.38
<b>Landcover</b>		
Natl-AnnCrops (%)	0.00000	0.00000 $\pm$ 0.00000
Natl-Barren (%)	0.00000	0.00000 $\pm$ 0.00000
Natl-BroadleafDense (%)	0.00000	0.00523 $\pm$ 0.02638
Natl-BroadleafOpen (%)	0.00000	1.35705 $\pm$ 2.04550
Natl-BroadleafSparse (%)	0.00000	0.31953 $\pm$ 0.53788
Natl-Coniferous (%)	0.00000	0.00000 $\pm$ 0.00000
Natl-ConiferousDense (%)	1.87137	4.95677 $\pm$ 7.46543
Natl-ConiferousOpen (%)	77.74379	34.34335 $\pm$ 18.65764
Natl-ConiferousSparse (%)	0.00000	1.39163 $\pm$ 1.60111
Natl-Deciduous (%)	0.00000	0.00000 $\pm$ 0.00000
Natl-Developed (%)	0.00000	0.00002 $\pm$ 0.00009
Natl-ExposedLand (%)	2.18266	16.95282 $\pm$ 9.64125
Natl-Grassland (%)	0.16214	5.60615 $\pm$ 5.17505
Natl-Herb (%)	6.70339	2.04978 $\pm$ 2.79736
Natl-MixedForest (%)	0.00000	0.00000 $\pm$ 0.00000
Natl-MixedwoodDense (%)	0.00000	0.02636 $\pm$ 0.08976
Natl-MixedwoodOpen (%)	0.00000	2.10440 $\pm$ 2.63686
Natl-MixedwoodSparse (%)	0.00000	0.01817 $\pm$ 0.04448
Natl-PerennCropsPast (%)	0.00000	0.00000 $\pm$ 0.00000
Natl-Rock/Rubble (%)	0.00000	6.97447 $\pm$ 7.52078
Natl-Shrubland (%)	0.00000	0.00000 $\pm$ 0.00000
Natl-ShrubLow (%)	5.87352	4.49178 $\pm$ 5.44294
Natl-ShrubTall (%)	0.00000	0.33533 $\pm$ 1.14136
Natl-SnowIce (%)	0.00000	7.70046 $\pm$ 9.06096
Natl-Water (%)	0.00000	0.14384 $\pm$ 0.45543
Natl-Wetland (%)	0.00000	0.00000 $\pm$ 0.00000

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Variable	NAWIN01	Predicted Group Reference Mean $\pm$ SD
Natl-WetlandHerb (%)	0.00000	0.00639 $\pm$ 0.02401
Natl-WetlandShrub (%)	0.00000	0.00868 $\pm$ 0.02574
Natl-WetlandTreed (%)	0.00000	0.00226 $\pm$ 0.00959
Reg-Ice (%)	0.00000	3.06094 $\pm$ 5.65390
<b>Substrate Data</b>		
%Bedrock (%)	0	1 $\pm$ 1
%Boulder (%)	0	3 $\pm$ 3
%Cobble (%)	20	64 $\pm$ 17
%Gravel (%)	13	2 $\pm$ 2
%Pebble (%)	65	31 $\pm$ 16
%Sand (%)	0	0 $\pm$ 0
%Silt+Clay (%)	2	0 $\pm$ 0
D50 (cm)	3.05	19.61 $\pm$ 30.65
Dg (cm)	3.0	20.3 $\pm$ 30.8
Dominant-1st (Category(0-9))	4	7 $\pm$ 1
Dominant-2nd (Category(0-9))	5	6 $\pm$ 1
Embeddedness (Category(1-5))	5	4 $\pm$ 1
PeriphytonCoverage (Category(1-5))	1	2 $\pm$ 1
SurroundingMaterial (Category(0-9))	3	3 $\pm$ 1
<b>Topography</b>		
ElevationMax (m)	2451.00000	2829.64865 $\pm$ 315.67549
ElevationMin (m)	1341.00000	1172.81081 $\pm$ 249.32284
ElevationStdev (m)	268.98831	342.56455 $\pm$ 77.02221
Reg-SlopeLT30% (%)	9.52894	16.26604 $\pm$ 8.50298
Slope30-50% (%)	32.91724	28.13773 $\pm$ 4.86732
Slope50-60% (%)	22.33010	14.11202 $\pm$ 1.82185
SlopeAvg (%)	54.07872	56.75540 $\pm$ 7.27461
SlopeGT60% (%)	33.98058	39.57775 $\pm$ 9.82818
SlopeLT30% (%)	10.77208	18.17250 $\pm$ 6.88627
SlopeMax (%)	140.26332	317.81636 $\pm$ 141.61151
SlopeMin (%)	2.51720	0.79557 $\pm$ 1.30240
SlopeStdev (%)	20.24787	29.56849 $\pm$ 5.64880
<b>Water Chemistry</b>		
CO3 (mg/L)	0.2500000	0.0000000 $\pm$ 0.0000000
General-Alkalinity (mg/L)	147.0000000	68.5944444 $\pm$ 52.1098452
General-DO (mg/L)	10.0000000	11.0635135 $\pm$ 0.9899052
General-pH (pH)	8.1	7.7 $\pm$ 0.7
General-SpCond ( $\mu$ S/cm)	589.0000000	160.3567568 $\pm$ 118.4083015
General-TempAir (Degrees Celsius)	14.5	10.5 $\pm$ 0.7
General-TempWater (Degrees Celsius)	7.5000000	5.5262162 $\pm$ 1.8860693
General-Turbidity (NTU)	0.7000000	0.1015000 $\pm$ 0.0459619
HCO3 (mg/L)	179.0000000	0.0000000 $\pm$ 0.0000000
Nitrogen-NO2 (mg/L)	0.0025000	0.0074306 $\pm$ 0.0217095
Nitrogen-NO2+NO3 (mg/L)	0.0790000	0.0315000 $\pm$ 0.0316491
Nitrogen-NO3 (mg/L)	0.0790000	0.0699722 $\pm$ 0.0547511
Phosphorus-OrthoP (mg/L)	0.0025000	0.0008750 $\pm$ 0.0012583
Phosphorus-TP (mg/L)	0.0025000	0.0025000 $\pm$ 0.0041986

Landslide Upstream of NAWIN03 in 2011 smothered site in fine sediment, no macro-invertebrates found