

Former Birch Run Dam

Conococheague Creek (former Chambersburg Reservoir)

Adams County, Pennsylvania, USA

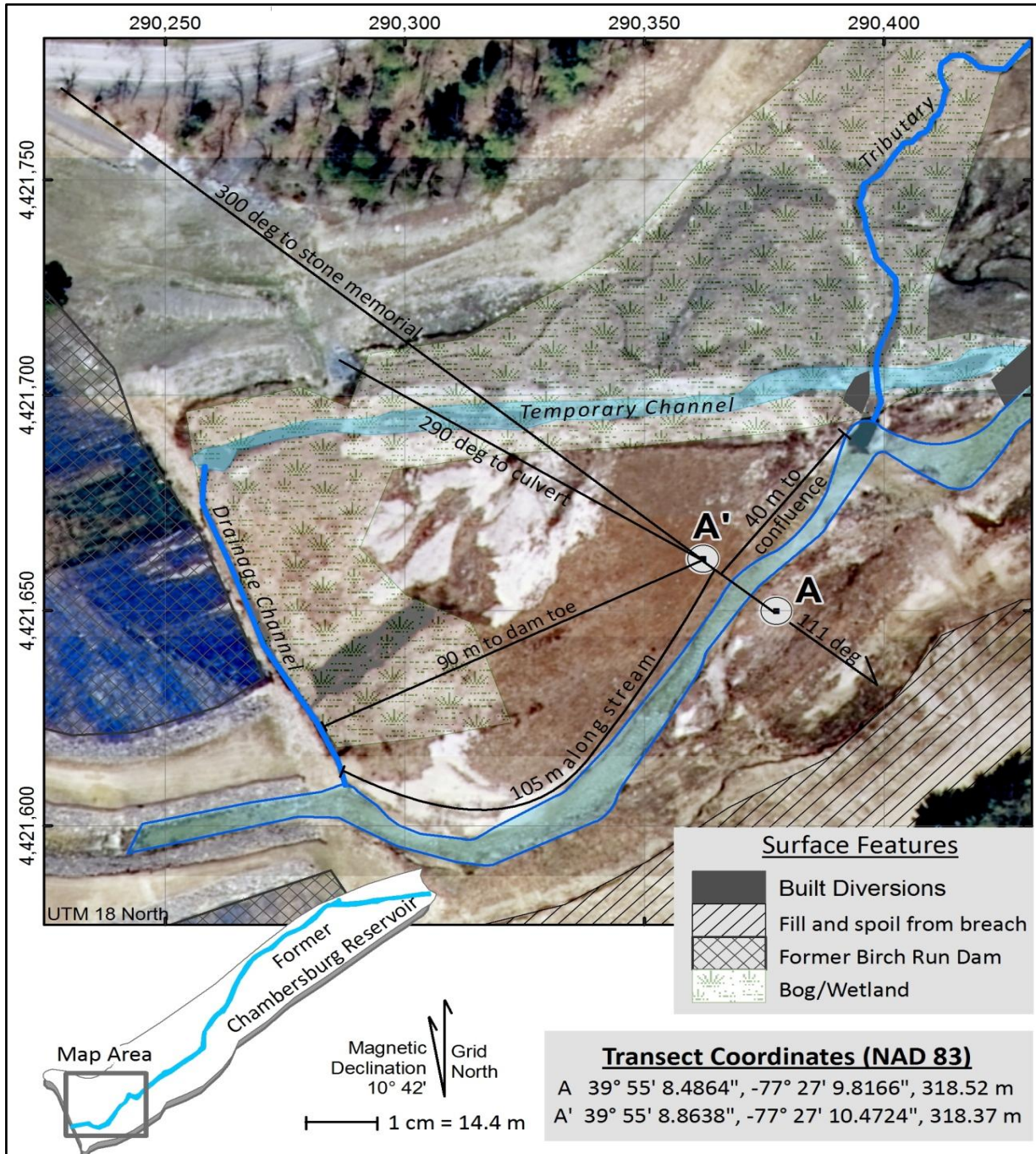
39° 55' 08" North, 77° 27' 16" West

The following pages record the measurements/observations at two cross sections ("alpha" and "bravo") of the Conococheague Creek within the former Chambersburg Reservoir impoundment. These raw data were collected as baseline data for future study. This file is intended to compliment the information included in the author's Master's thesis.

Work completed by James Manuel 2009

Shippensburg University

Location of Alpha Transect



The location of the *Alpha* study reach is identifiable based on its spatial relationship with the former Birch Run Dam and a variety of other physical features. Map features are projected and the grid is displayed with the Universal Transverse Mercator (UTM) system, 18 North.

Location of Alpha Transect

Parking

Accessing the *Alpha* transect is easiest by parking in the lower lot (downstream of the former Birch Run Dam) and walking through the breach. Parking is also accessible alongside the top of the former dam; however it is less convenient to walk down from this location and across the wetland.

Walking upstream

The Alpha transect is less than 100 m from the upstream toe of the former Birch Run Dam (Figure 3a). A small stream (approximately 50 cm wide) parallel to the dam was dug to drain the wetland. At the time of this report, there is a lightly beaten path near the right bank of the Conococheague Creek. When walking on this path the Alpha transect is approximately 105 m after crossing the small drainage stream. The A' end-point is on the opposite side of the path than the stream channel (on the left as you walk upstream).

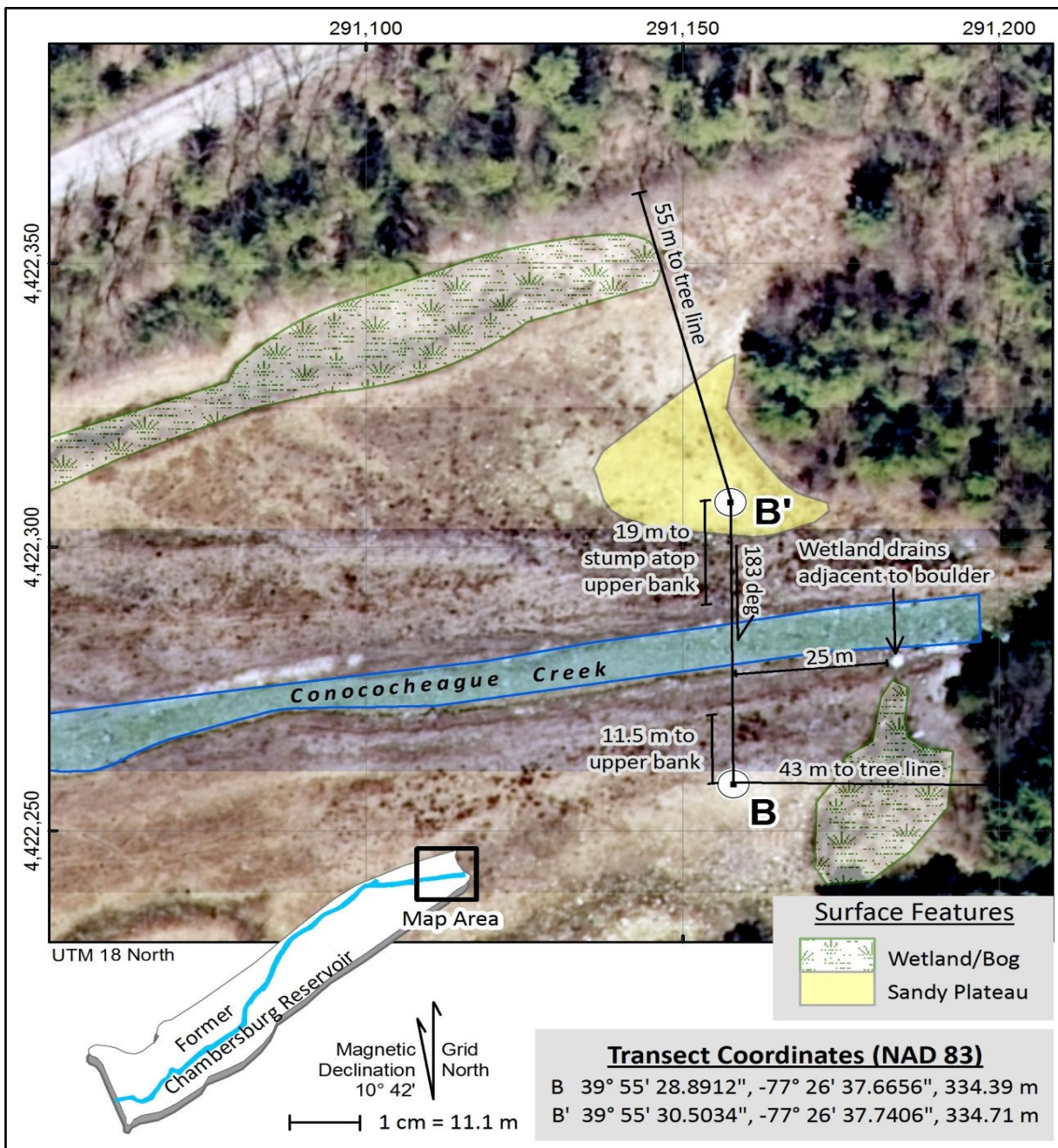
Walking downstream

Upstream of the Alpha reach is the confluence of the Conococheague Creek and a minor tributary (Figure 3a). Prior to the confluence, the Conococheague Creek is quite wide (approximately 10 m) and abruptly turns to the right (as viewed looking downstream). If the tributary is dry or has changed routes, the confluence can be identified by the limestone riprap armoring the right side of the tributary banks. The Alpha cross-section is 40 m downstream of the confluence. At the time of this study, the Alpha transect is within the first clearing of grass as you walk from the confluence.

Orientation

The A' end-point of the Alpha reach is currently in a grassy clearing. This should allow a clear view of the top of the right side of the dam. There is a large stone monument along the road at the parking area adjacent to the former dam. When viewed from the A' end-point, the stone monument is approximately 300 degrees. After locating the A' end-point, the transect across the stream to the A end-point is 111 degrees.

Location of Bravo Transect



The location of the *Bravo* transect is identifiable based on its spatial relationship with the relict shorelines of the former Chambersburg Reservoir and the Conococheague Creek. Map features are projected and the grid is displayed with the Universal Transverse Mercator (UTM) system, 18 North.

Location of Bravo Transect

Parking

Accessing the Bravo reach from the road requires finding a safe place to park on the shoulder of the road, State Route 233. There are two places where the shoulder is barely wide enough to park a car. If parking here, do so with extreme caution because there is a sharp turn in the road very nearby. The hill down to the valley is steep. There is a lightly beaten path that can be used to walk down the hill safely.

Walking from the Former Dam

If walking along the stream, the flood plain on the left side of the valley is slightly easier walking due to the barren grasslands that begin approximately halfway to the Bravo reach. When walking along the grasslands, beware of minor gullies that are sometimes difficult to see from a distance. The Conococheague Creek flows largely straight from the Bravo reach until it reaches the right valley hillside. The wetland area along the toe of the hill drains into the channel near the small island. The Bravo reach is approximately 260 meters from this meander, nearly adjacent to the edge of the tree line (Figure 4a). If walking from the former dam, the fastest route is along the built bench on the south side of the valley. The bench ends more than 200 m before the end of the former impoundment. Continue walking upstream along the treeline to find the Bravo reach. At the time of this study, there was standing water along the toe of the bench from the culvert to the bench terminus.

Locating the transect

The B' end-point is more than 100 m from the edge of the road. At the edge of the tree line (approximate maximum water elevation for the Chambersburg Reservoir at capacity) there were numerous tree stumps and standing water. From the tree line, the B' end-point is approximately 55 m away (Figure 4a). The end-points of the Bravo transect are in large stumps on the grassy floodplain. The end-point on the right floodplain is upon a barren area of sandy soil, less than 15 m from the tree line. The Bravo transect, bearing 183 degrees, passes alongside a large stump at the top of the right upper bank, approximately 19 m from the B' end-point. There is a large boulder on the lower terrace, adjacent to where the wetland drains into the Conococheague Creek; the transect is 25 m downstream from the boulder.

Alpha Cross Sections

March			May		
Distance (m)	Elevation	Notes	Distance (m)	Elevation	Notes
0	318.523		-6.096		
0.6096	318.617488		-1.3716		
1.2192	318.443752		1.4478	318.44	
1.8288	318.437656				
2.4384	318.440704		2.5908	318.418664	
3.048	318.468136				
3.6576	318.458992				
4.2672	318.419368	Upper Bank	4.5212	318.388184	Upper Bank
5.1816	318.059704		4.826	318.123008	slope
5.588	317.870728	Lower Bank	5.5118	317.827352	Lower Bank
5.715	317.407432	toe	5.7658	317.492072	toe
6.0198	317.343424	Water	6.096	317.333576	Water
6.3246	317.352568	Water	6.4008	317.303096	Water
6.6294	317.346472	Water	6.7056	317.351864	Water
6.9342	317.33428	Water	7.0104	317.336624	Water
7.239	317.322088	Water	7.3152	317.339672	Water
7.5438	317.355616	Water	7.62	317.367104	Water
7.8486	317.358664	Water	7.9248	317.354912	Water
8.1534	317.41048	Water	8.2296	317.406728	Water
8.4582	317.389144	Water	8.5344	317.397584	Water
8.763	317.41048	Water	8.8392	317.41892	Water
9.0678	317.413528	Water	9.144	317.425016	Water
9.3726	317.413528	Water	9.4488	317.40368	Water
9.6774	317.437912	Water	9.7536	317.458544	Water
9.9822	317.459248	Water			
10.287	317.450104	toe			
			10.4394	317.455496	toe
10.4648	317.925592	Lower Bank	10.5918	317.885264	Lower Bank
10.668	317.907304		11.2776	317.979752	slope
11.2776	318.007888				
11.8872	318.169432		12.2174	318.235784	slope
12.4968	318.300496		13.1318	318.40952	Upper Bank
13.1064	318.388888	Upper Bank			
13.716	318.50776		14.0208	318.53144	
14.3256	318.556528				
14.9352	318.580912		15.367	318.641168	
15.5448	318.620536				
16.1544	318.61444		16.4338	318.60764	
16.764	318.611392				
17.3736	318.61444				
17.9832	318.635776		18.669	318.616784	
18.5928	318.635776				
19.2024	318.623584				
19.812	318.8278	atop rebar			atop rebar

Bravo Cross Sections

March			May		
Distance (m)	Elevation	Notes	Distance (m)	Elevation	Notes
0	334.39				
1.524	333.990712		0.9144	334	
3.048	333.884032		4.8768	333.804928	
6.096	333.740776				
7.62	333.789544		7.9248	333.807976	
9.144	333.853552				
10.668	333.820024	Upper Bank			
12.192	333.752968		11.5824	333.734824	Upper Bank
			12.8016	333.615952	
13.4112	333.621904		13.5128	333.408688	
			13.9446	333.26848	
			14.3002	333.103888	
			14.5542	333.000256	
14.7828	332.945248		14.7828	332.94844	
			15.24	332.853952	
			15.8496	332.853952	
16.764	332.859904		16.4592	332.823472	
			17.0688	332.823472	
			17.6784	332.823472	
			18.288	332.783848	
19.05	332.594728	Lower Bank	18.8976	332.7046	Lower Bank
19.304	332.28688	toe	19.4818	332.436376	slope
19.6596	332.250304	water	19.5072	332.287024	toe
19.9644	332.207632	water	19.9644	332.244352	water
20.2692	332.189344	water			
20.574	332.158864	water	20.574	332.207776	water
20.8788	332.143624	water			
21.1836	332.052184	water	21.1836	332.12548	water
21.4884	332.091808	water			
21.7932	332.100952	water	21.7932	332.207776	water
22.098	332.070472	water			
22.4028	332.055232	water	22.4028	332.113288	water
22.7076	332.0278	water			
23.0124	332.036944	water	23.0124	332.0188	water
23.3172	332.079616	water			
23.622	332.055232	water	23.622	332.055376	water
23.9268	332.079616	water			
24.2316	332.036944	water	24.2316	332.027944	water
24.5364	332.01256	water			
24.8412	332.036944	water	24.8412	331.994416	water
25.146	332.091808	water			
25.4508	332.08876	water	25.4508	332.128528	water
25.7556	332.05828	water			
26.0604	332.094856	water	26.0604	332.052328	water
26.3652	332.100952	water			
26.67	332.128384	water	26.67	332.12548	water
26.9748	332.189344	water			
27.2796	332.305168	Rock (1.5' width)	27.2796	332.20168	water
27.7368	332.228968	toe	27.8892	332.210824	water
			27.94	332.427232	toe
28.6512	332.841616	Lower Bank	28.956	332.911864	Lower Bank
29.5656	333.402448		29.5656	333.265432	
			30.1752	333.579376	
30.7848	333.820024	Upper Bank	30.7848	333.783592	Upper Bank
			31.3944	333.87808	Upper Bank
			32.004	333.90856	
33.528	333.899272		32.9184	333.9238	
36.576	333.771256		36.8808	333.774448	
39.624	333.68896		40.8432	333.722632	
42.672	333.820024				
45.72	333.984616		44.196	333.905512	
49.6824	334.789288		47.85	334	

Discharge -- Alpha

04.Mar.09

Stream Discharge at Transect Alpha

Conococheague Creek in the former Burch Run Reservoir (Chambersburg, PA)

Water Elevation = 317.4 m (above sea level)

Channel Width = 15.25 feet (4.6 m)

Station	Distance to $b_i +1$ (ft.)	Distance to $b_i -1$ (ft.)	Depth (d_i) at b_i (ft.)	Velocity (ft./sec.)		q_i
				Point	Average	
b_1	19.25	18.75	0.4	0.449	-	0.045
b_2	20.5	19.25	0.8	0.726	-	0.363
b_3	21.25	20.5	0.8	1.369	-	0.411
b_4	22	21.25	0.8	1.154	-	0.346
b_5	22.75	22	0.9	1.006	-	0.340
b_6	23.5	22.75	0.9	1.056	-	0.356
b_7	24.25	23.5	0.8	0.456	-	0.137
b_8	25	24.25	0.9	1.454	-	0.491
b_9	25.75	25	0.9	1.616	-	0.545
b_{10}	26.5	25.75	0.7	1.995	-	0.524
b_{11}	27.25	26.5	0.7	6.215	-	1.631
b_{12}	27.75	27.25	0.7	4.306	-	0.754
b_{13}	28.25	27.75	0.8	4.996	-	0.999
b_{14}	29	28.25	0.7	5.034	-	1.321
b_{15}	29.75	29	0.6	4.196	-	0.944
b_{16}	30.5	29.75	0.6	6.051	-	1.361
b_{17}	31.25	30.5	0.7	3.986	-	1.046
b_{18}	32	31.25	0.6	3.167	-	0.713
b_{19}	32.75	32	0.5	1.201	-	0.225
b_{20}	34	32.75	0.6	3.592	-	1.347
				0.7	2.70125	13.8996125
				0.21336		
				1.04666667		

Discharge- Bravo

04.Mar.09

Stream Discharge at Transect Beta

Conococheague Creek in the former Burch Run Reservoir (Chambersburg, PA)

Water Elevation = 332.1 m (above sea level)

Channel Width = 26.0 feet (7.9 m)

Velocity (ft./sec.)

Station b_i	Distance to b_i +1 (ft.)	Distance to b_i 1 (ft.)	Depth (d_i) at b_i (ft.)	Point	Average	q_i
b_1	7.00	1.00	0.4	0.362	-	0.4344
b_2	8.17	7.00	0.3	0.615	-	0.107625
b_3	9.75	8.17	0.0	0.000	-	0
b_4	10.50	9.75	0.5	1.790	-	0.335625
b_5	11.17	10.50	0.7	2.462	-	0.5744667
b_6	11.75	11.17	0.5	2.503	-	0.3650208
b_7	12.08	11.75	0.5	2.408	-	0.2006667
b_8	12.67	12.08	0.6	2.240	-	0.392
b_9	13.33	12.67	0.8	2.033	-	0.5421333
b_{10}	14.00	13.33	0.7	2.498	-	0.5828667
b_{11}	14.67	14.00	0.6	2.576	-	0.5152
b_{12}	15.33	14.67	0.6	2.295	-	0.459
b_{13}	16.00	15.33	0.7	2.426	-	0.5660667
b_{14}	16.67	16.00	0.8	2.504	-	0.6677333
b_{15}	17.33	16.67	0.8	1.366	-	0.3642667
b_{16}	18.00	17.33	0.7	0.083	-	0.0194133
b_{17}	19.00	18.00	0.5	0.331	-	0.08275
b_{18}	20.75	19.00	0.0	0.000	-	0
b_{19}	22.00	20.75	0.5	0.198	-	0.061875
b_{20}	23.33	22.00	0.4	1.434	-	0.3824
b_{21}	24.75	23.33	0.4	0.365	-	0.1034167
b_{22}	27	24.75	0.4	1.187	-	0.53415
				1.58381		7.291076
				0.57		
				0.173736		

Discharge- Bravo

29.May.09

Stream Discharge at Transect Beta

Conococheague Creek in the former Burch Run Reservoir (Chambersburg, PA)

Water Elevation = 332.2 m (above sea level)

Channel Width = 26.0 feet

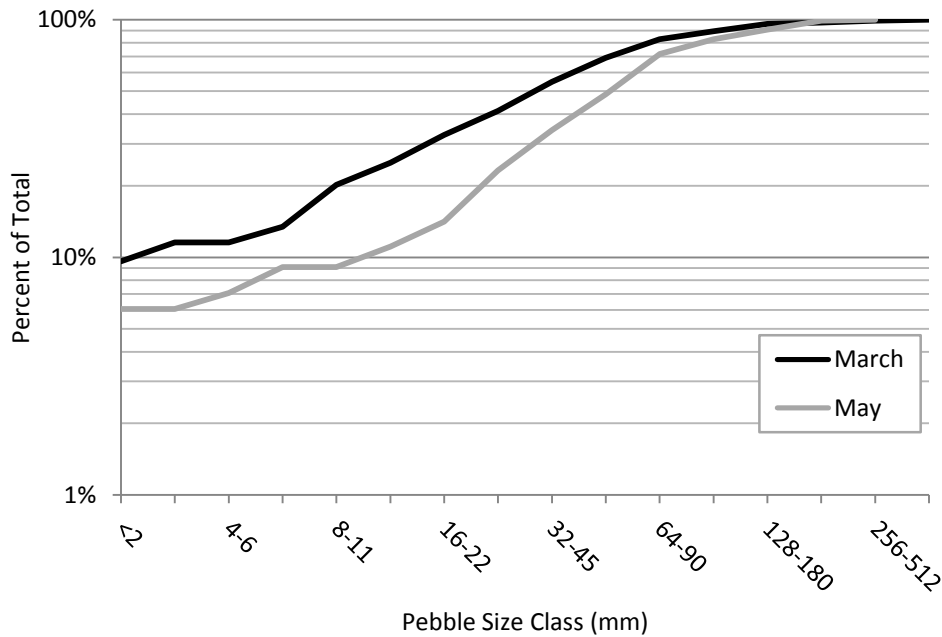
Velocity (ft./sec.)

Station b_i	Distance to $b_i +1$ (ft.)	Distance to $b_i -1$ (ft.)	Depth (d_i) at b_i (ft.)	<u>Velocity (ft./sec.)</u>				Revolutions
				Point	Average	Area	q_i	
b_1	66.00	64.00	0.5	1.001	-	0.5	0.5005	41
b_2	68.00	66.00	0.6	0.893	-	0.6	0.5358	36
b_3	69.75	68.00	0.9	1.556	-	0.7875	1.22535	64
b_4	71.00	69.75	1.0	1.995	-	0.625	1.246875	82
b_5	72.00	71.00	1.0	1.017	-	0.5	0.5085	42
b_6	73.00	72.00	1.1	2.864	-	0.55	1.5752	118
b_7	74.00	73.00	1.0	1.862	-	0.5	0.931	77
b_8	75.00	74.00	1.2	3.145	-	0.6	1.887	130
b_9	76.00	75.00	1.5	2.707	-	0.75	2.03025	112
b_{10}	77.00	76.00	1.4	2.444	-	0.7	1.7108	101
b_{11}	78.00	77.00	1.2	2.282	-	0.6	1.3692	94
b_{12}	79.42	78.00	1.1	1.393	-	0.7791667	1.0853792	57
b_{13}	81.00	79.42	1.3	2.168	-	1.0291667	2.2312333	89
b_{14}	82.00	81.00	1.4	1.223	-	0.7	0.8561	50
b_{15}	84.50	82.00	0.9	0.937	-	1.125	1.054125	38
b_{16}	85.58	84.50	1.0	2.187	-	0.5416667	1.184625	90
b_{17}	86.75	85.58	0.9	1.995	-	0.525	1.047375	82
b_{18}	87.67	86.75	0.9	1.899	-	0.4125	0.7833375	78
b_{19}	88.58	87.67	0.5	0.702	-	0.2291667	0.160875	29
b_{20}	91.25	88.58	0.5	2.194	-	0.6666667	1.4626667	91
			1.00	1.8232		12.720833	23.38619	
			0.303276	0.555711			0.655	
			0.173736					

Bed Material -- Alpha

Wolman (1954) Pebble Count Methodology

Size Class	Size Range (mm)	March		May	
		Count	Percent Smaller	Count	Percent Smaller
Sand	<2	10	9.6%	6	6.1%
Very Fine Gravel	2-4	2	11.5%	0	6.1%
Fine Gravel	4-6	0	11.5%	1	7.1%
Fine Gravel	6-8	2	13.5%	2	9.1%
Medium Gravel	8-11	7	20.2%	0	9.1%
Medium Gravel	11-16	5	25.0%	2	11.1%
Coarse Gravel	16-22	8	32.7%	3	14.1%
Coarse Gravel	22-32	9	41.3%	9	23.2%
Very Coarse Gravel	32-45	14	54.8%	11	34.3%
Very Coarse Gravel	45-64	15	69.2%	14	48.5%
Small Cobble	64-90	14	82.7%	23	71.7%
Medium Cobble	90-128	7	89.4%	11	82.8%
Large Cobble	128-180	7	96.2%	8	90.9%
Very Large Cobble	180-256	1	97.1%	8	99.0%
Small Boulder	256-512	2	99.0%	1	100.0%
Medium Boulder	512-1024	1	100.0%	0	100.0%
Large Boulder	1024-2048	0	100.0%	0	100.0%
Very Large Boulder	2048-4096	0	100.0%	0	100.0%
		104		99	



Bed Material -- Bravo

Wolman (1954) Pebble Count Methodology

Size Class	Size Range (mm)	March		May	
		Count	Percent Smaller	Count	Percent Smaller
Sand	<2	5	4.5%	2	2.0%
Very Fine Gravel	2-4	0	4.5%	0	2.0%
Fine Gravel	4-6	3	7.3%	2	3.9%
Fine Gravel	6-8	4	10.9%	4	7.8%
Medium Gravel	8-11	4	14.5%	6	13.7%
Medium Gravel	11-16	4	18.2%	7	20.6%
Coarse Gravel	16-22	9	26.4%	6	26.5%
Coarse Gravel	22-32	7	32.7%	3	29.4%
Very Coarse Gravel	32-45	4	36.4%	4	33.3%
Very Coarse Gravel	45-64	16	50.9%	4	37.3%
Small Cobble	64-90	10	60.0%	13	50.0%
Medium Cobble	90-128	15	73.6%	9	58.8%
Large Cobble	128-180	13	85.5%	15	73.5%
Very Large Cobble	180-256	5	90.0%	15	88.2%
Small Boulder	256-512	5	94.5%	8	96.1%
Medium Boulder	512-1024	4	98.2%	4	100.0%
Large Boulder	1024-2048	2	100.0%	0	100.0%
Very Large Boulder	2048-4096	0	100.0%	0	100.0%
		110		102	

