

**REPORT OF 1959 SURVEY OF SEDIMENT BASINS
BELOW STREAM GAGES ON WATERSHEDS 1, 2, 3**

by

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As part of the study of erosion in the 3 small watersheds, the silt basins were remeasured July 27-29, 1959. A report of the measurements and analysis of sedimentation in the 1959 water year follows.

Measurement

Measurement techniques followed those set up by Graber. The silt basins were cross-sectioned each 3 feet with lines perpendicular to the control lines. A measurement was then taken at 3 foot intervals along these cross lines. A level and rod were used to make the measurements. As suggested by Graber, the bottom of the rod was covered by a 10" by 7" metal sheet. In the initial reading made from the bench mark, the rod was placed on the head of the reference spike.

Permanent stakes were driven in the ground along the primary and secondary control lines in Watersheds 1 and 2. In Watershed 3, stakes were put along the secondary control line; nails driven in the dam on the primary line are permanent and easy to locate. An aluminum tag, marked with the line number, is placed on each stake. Stakes and tags were both painted yellow to make relocation easy in future years. Permanent stakes should end the problem of line location mentioned by Franklin and Sabo in the reports of 1957 and 1958.

Calculations

The procedure for calculating accumulated sediment has been altered this year. It is believed the new procedure developed will be adequate for the coming years and will lead to more uniform results. The procedure is based on:

(1) The same area for the sediment basins will be used each year. Area of the ponds was found by assuming that each point represents an area of 9 square feet. The area of each basin was found by using the same number of points used by Franklin in his calculations for 1957. It will no longer be necessary to determine the area of the ponds as they change from year to year.

(2) The same points will be measured and used in the calculations each year. This applies even if some points are above water due to accumulating sediment. The use of the same basin area and same points will enable changes in the basin to be compared for any years desired. Points used in the calculations are marked with a red check on the field sheets.

The actual calculations have been simplified. Rod heights for the points are added and an average rod height found. By subtracting the average rod height from the line of sight, the elevation of the bottom pond is obtained. The difference between the 1959 depth and the 1958 depth multiplied by pond area gives the cubic feet of sediment accumulated for 1959. Water surface heights are no longer needed since the elevation of the pond bottom is figured from the line of sight and average rod heights.

General Comments

In Watershed 3, 14 points were deleted this year. Eight of the points were on line 1. The deleted readings were on a steep bank at or near water line. Two points on line 2 which were on a rock were dropped as were 4 points on line 10 along a log. At station 3, readings were made along the dam where the bottom of the pond intersects the dam. Exact footages of the readings are found on the field work sheets.

The negative accumulations found in Watershed 1 were probably due to compaction of the bottom. Parts of the basin had to be remeasured due to difficulty with the rod. The compaction due to walking was probably enough to make a significant difference in the final calculations.

Data from previous years was refigured using the standard basin area and number of points. A summary of the sediment accumulation for the individual years and total accumulation is found on a separate sheet in this report.

The weighted average for the three basins for the years 1956-1959 was 1.49 cubic feet of sediment per acre per year.

Summary of Sediment Accumulation for 1957-1959

Year	No. Points	Line of sight	av. Rod Reading	av. Bottom Level	Change	Basin area in sq. ft.	Total accum. cubic ft.	av. accum. ft ³ / acre	av. annual accum. per acre
Watershed #1						237 Acres			
1956	237	112.410	6.833	105.577					
					+0.255	2133	543.915	2.30	
1957	237	113.250	7.418	105.832					
					+0.155	2133	330.615	1.40	
1958	237	113.120	7.133	105.987					
					-0.018	2133	-38.394	-0.16	
1959	237	113.170	7.201	105.969					
1956-59	237				+0.402		+836.136	3.54	1.18
Watershed #2						149 Acres			
1956	224	108.100	7.097	101.003					
					+0.189	2016	381.024	2.56	
1957	224	107.080	5.888	101.192					
					+0.260	2016	524.160	3.52	
1958	224	108.280	6.828	101.452					
1958*	224	108.280	6.878	101.402					
					+0.045	2016	90.720	0.61	
1959	224	106.920	5.473	101.447					
1956-59	224				+0.494		995.904	6.69	2.23
Watershed #3						250 Acres			
1956	183	95.560	6.639	88.921					
					+0.231	1647	380.457	1.52	
1957	183	97.630	8.478	89.152					
					+0.346	1647	569.862	2.28	
1958	183	98.920	9.422	89.498					
1958	169	98.920	9.657	89.263					
					+0.040	1647	65.880	0.26	
1959	169	98.680	9.377	89.303					
1956-59	169				+0.617		3016.199	4.06	1.35

*Remeasured after some sediment was removed from the basin

Benchmark:
H.I.
Elev.

Experimental Area: HJ Andrews
Basin Location: WS #1

Date: 7/27/59
Party: Level Rothacher
Rod: Sturges
Notes: Rothacher

Station*	Transects (Designated in ft. starting at crest of dam)													
	Line 1		Line 2		Line 3		Line 4		Line 5		Line 6		Line 7	
	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.
00														
01														
02		<u>Water</u>												
03		<u>line 2</u>												
04	5.21		3.73	WE 7.9	3.72	WE 7.9	4.72	WE 8.0	3.66		3.59	WE 8.4	3.63	WE 8.5
07	5.10	W 4.4	5.71		6.25		5.96		6.14	WE 8.4	5.33		5.45	
12	6.42	4.6	7.46		8.11		8.06		7.94		7.85		7.64	
15	6.97	4.9	9.02		9.53		9.35		9.52		9.55		9.09	
18	7.00	5.0	9.10		10.50		10.70		10.85		10.77		10.55	
21	7.82	5.4	8.90		10.40		10.45		12.25		9.84		13.19	
24	6.37	5.3	8.84		9.90		9.48		9.11		8.96		9.36	
27	6.65	5.8	8.26		9.26		9.03		8.94		8.68		8.42	
30	6.58	4.1	7.95		8.50		8.73		8.70		8.37		8.12	
33		3.5	7.82		8.44		8.38		8.52		8.58		8.13	
36		1.3	7.08		8.04		8.14		8.83		8.71		8.74	
39		0.9	6.73		7.55		7.68		8.20		8.90		8.73	
42		0.6	5.76		7.24		7.28		8.19		8.70		8.81	
45			5.26		6.59		7.23		7.99		8.52		8.49	
48			5.20		5.79		7.18		7.05		8.50		8.14	
51			4.88	WE 5.1	6.44		6.20		7.27		7.75		7.67	
54			4.85	WE 5.4	6.18	WE 5.3	6.66		6.49		7.28		7.34	
57					4.41		6.00		6.10		6.83		7.26	
60					3.62		4.80	WE 5.4	5.43		6.42		6.51	
63							4.43		5.06		6.35		6.72	
66							4.04		4.69	WE 5.7	6.12		6.57	
69							3.95		4.39		5.54		6.07	
72									4.34		4.68	WE 5.5	5.71	WE 7.2
75									4.25				4.80	

(7) (10) (16) (19) (22) (22) (22)

Rod on B.M.	13. 17	Recheck	13.17
Assumed elev.	100. 00		
Line of Sight	113. 17		
Rod on Water Surface	4. 82		
Elev. of Water	108. 35		

Total	47.16	80.19	128.32	146.04	164.63	171.77	172.52
Average							

*Numbered to right starting with 0 at borderline which extends upstream from left end of dam.

RI - NW
SOIL STABILIZATION
Watersheds
Benchmark:
H.I.
Elev.

ELEVATIONS OF SEDIMENT ACCUMULATED
IN CATCHMENT BASINS

FORM RI-2

Date: 7/28/59
Party: Level Sturges
Rod Rothacker
Notes Sturges

Experimental Area: HJ Andrews
Basin Location: WS #2

Station*	Transects (Designated in ft. starting at crest of dam)													
	Line 1		Line 2		Line 3		Line 4		Line 5		Line 6		Line 7	
	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.
00														
03			3.13	WE 6.8	3.52	WE 5.2	4.34	WE 3.1	4.74	WE 2.9	4.85	WE 2.6	4.45	WE 3.3
06			4.13	WW	5.00		6.04		5.79		5.98		5.40	
09			4.91	" 0.2	5.67		6.25		6.25		6.23		5.9	
12			4.76	" 0.2	5.81		6.26		6.30		6.33		6.19	
15			5.23	WE 0.9	6.04		5.92		5.85		6.14		6.13	
18			5.22	" 1.4	5.94		5.75		5.92		6.11		6.08	
21	4.78		5.98	" 3.4	5.87		5.68		5.94		5.98		6.25	
24	5.54		5.96	" 3.9	5.80		5.72		6.24		5.89		6.30	
27	5.50		5.74	" 4.0	5.82		6.14		6.46		5.90		6.39	
30	5.44		5.43	" 4.1	5.92		6.53		6.54		6.10		6.38	
33	4.76		5.71	" 3.2	5.91		6.50		6.60		6.26		6.31	
36			6.42	" 2.6	6.10		6.62		6.53		6.33		6.13	
39			6.39	" 1.4	6.14		6.48		6.47		6.20		5.58	
42			5.90	" 1.7	5.00	WE 4.5	5.48		5.99		5.25		4.92	
45			4.84	WW 0.9	4.41	middle	4.42	WE 4.4	4.62	WE 3.2	4.42	WE 4.4	4.08	WE 4.2
48			4.02	WE 4.3	4.38	crack	4.15		4.09		3.79		4.12	
51				↑	4.17		3.62		3.57		3.65		3.87	
54					3.97	crack	3.57				3.55		3.61	
57					3.31	crack								

↑ off set to west

Rod on BM 6.92
Assumed elev 100.00
Line of sight 106.92

Rod on Surface 114.68
(2) 4.68
(3) 4.75
(4) 4.82

Total	11.04	57.98	87.98	95.35	101.79	99.16	89.95
Average	No points = 224	Total all points = 1225.84		AVE. = 5.473			

*Numbered to right starting with 0 at borderline which extends upstream from left end of dam.

ELEVATIONS OF SEDIMENT ACCUMULATED
IN CATCHMENT BASINS

Benchmark:
H.I.
Elev.

Experimental Area: H.J. Andrews
Basin Location: WS # 3

Date: 7/29/59
Party: Level Rothacher
Rod Sturges
Notes Rothacher

Station*	Transects (Designated in ft. starting at crest of dam)													
	Line 8		Line 9		Line 10		Line 11		Line 12		Line 13		Line 14	
	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.
00														
05	10.62	4.2	10.37	3.8	9.99	4.1	10.15	4.6	9.98	4.9	9.08	4.2	7.38	
08	10.21		9.89		9.78		9.95		10.19		9.64		8.21	
10	9.82		9.79		9.79		10.00		10.11		9.82		9.28	
12	9.74		9.75		9.75		10.16		10.32		10.09		8.52	
15	9.92		9.83		9.92		10.26		10.34		9.83		8.46	
18	10.00		10.03		10.05		10.37		10.20		9.20		7.28 WE	
21	10.18		10.08		10.19		10.55		9.71		8.35			
24	10.21		10.24		10.46		10.43		9.24		7.79			
27	10.17		10.41		10.08		9.35		8.72		7.35 WE 28			
30	10.01		9.66		9.45	<i>10.01</i>	8.86		8.90					
33	9.45		8.94		7.15	10.9	8.86		8.58					
36	7.97		7.92 WE 38.0		8.20		8.69		7.42					
39	7.05 <i>bottom</i>		6.45 <i>bottom</i>		6.71 <i>bottom</i>	10.9 <i>top</i>	8.55		7.00					
42	7.00 <i>bottom</i>				6.01	10.9	8.24		6.76					
45					7.91		7.55	WE 42.6	5.86					
48					7.36	WE 43.3	6.75							
51					6.76									

(14)	(12)	(12)	(16)	(13)	(9)	(5)

Line sight				98.68										
FS TP =				2.92										
				95.76										
BS TP				10.39		rod assumed		102.00						
LS				106.15				LS						
FS Nail				6.16										
				99.99										
BS Nail				6.16										
				106.16										
FS Brass				1.76										
				104.40										
Plate														
Total	132.37		116.94		113.68		148.75		120.71		81.13		40.85	
Average	Total		1,584.64				Ave. rod = 9.377				No. points = 169			

*Numbered to right starting with 0 at borderline which extends upstream from left end of dam.