Water-Data Report 2013

03230450 HELLBRANCH RUN NEAR HARRISBURG OH

Scioto Basin
Upper Scioto Subbasin

LOCATION.--Lat 39°50'52.2", long 83°09'26.4" referenced to North American Datum of 1983, Franklin County, OH, Hydrologic Unit 05060001, on right downstream side of State Route 665 bridge, 2.5 mi upstream from mouth, 2.7 mi north-northwest of Harrisburg and 1.5 mi east of Darbydale.

DRAINAGE AREA.--35.8 mi^2.

SURFACE-WATER RECORDS

PERIOD OF RECORD.--October 1992 to current year.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 811.50 ft. NAVD 1988; previously described as: "Elevation of gage is 813 ft above sea level (from topographic map). Prior to Sept. 2001 at site 1.5 mi downstream at datum of 785 ft."

REMARKS.--Records fair except for estimated records, which are poor. Water-quality data collected at this site.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 300 ft^3/s and (or) maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar 12	0045	383	6.41
Mar 18	1545	*516	*6.77
Jul 10	1900	350	6.31
Jul 22	1715	492	6.71

Minimum discharge, 0.04 ft^3/s, Oct. 5, 19, gage height, 4.23 ft.

Suggested citation: U.S. Geological Survey, 2014, Water-resources data for the United States, Water Year 2013: U.S. Geological Survey Water-Data Report WDR-US-2013, site 03230450, accessed at http://wdr.water.usgs.gov/wy2013/pdfs/03230450.2013.pdf

03230450 HELLBRANCH RUN NEAR HARRISBURG OH—Continued

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013
DAILY MEAN VALUES
[e, estimated]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	0.62	20	0.37	e9.1	58	52	21	41	3.1	69	6.3	7.8
2	0.47	16	0.47	e8.1	48	37	16	30	3.5	33	4.8	5.6
3	0.24	8.9	0.94	e7.3	28	28	14	23	2.6	19	3.8	2.3
4	0.12	5.0	0.82	e7.4	e22	21	13	19	2.1	12	3.3	1.2
5	0.09	3.3	17	e6.5	e16	20	13	16	1.8	19	2.5	0.72
6	0.85	2.3	13	e6.9	e13	28	11	13	4.8	38	2.0	0.55
7	8.0	1.7	11	e6.6	e13	64	10	12	5.3	84	1.8	0.46
8	4.8	1.0	32	e6.5	35	121	9.3	11	3.8	75	13	0.44
9	2.6	0.76	20	14	35	113	8.9	9.6	2.8	123	37	0.34
10	1.5	0.69	33	35	27	82	8.7	18	14	197	15	0.26
11	0.54	0.55	20	132	28	165	11	41	22	163	8.1	0.48
12	0.34	1.1	9.6	106	23	246	77	28	12	76	4.9	3.2
13	0.21	12	5.9	60	20	121	53	19	68	44	8.4	7.4
14	0.15	10	3.3	120	17	71	33	16	47	27	3.9	2.6
15	0.11	5.6	2.2	60	15	52	25	13	21	17	2.3	1.3
16	0.49	3.6	1.6	40	13	49	42	12	14	12	1.7	1.1
17	0.36	2.0	1.1	30	e11	40	120	11	11	16	1.4	0.69
18	0.17	1.6	4.0	22	e9.0	284	68	8.9	8.6	11	1.2	0.55
19	0.30	1.1	4.2	18	13	240	78	8.6	6.4	8.0	0.98	0.51
20	2.2	0.84	23	17	11	120	67	7.5	4.2	7.0	0.87	0.52
21	3.2	0.77	75	13	9.2	72	39	6.4	3.0	11	0.78	29
22	2.9	3.2	34	e10	9.0	49	29	5.7	2.7	223	0.84	25
23	1.7	1.5	23	e8.8	10	37	24	6.4	2.4	177	2.6	9.7
24	1.1	0.88	16	e7.3	9.4	31	39	4.7	1.9	74	1.8	4.9
25	0.79	0.80	13	e6.6	8.1	31	63	4.5	1.6	39	1.2	2.8
26	0.59	0.65	12	e6.4	14	35	36	3.6	2.6	22	0.83	1.9
27	0.74	1.5	11	e5.4	91	49	27	3.4	11	19	0.81	1.2
28	1.3	1.8	10	e20	71	37	30	3.6	10	19	0.79	1.1
29	9.7	0.80	10	37	---	29	79	3.4	10	11	0.79	1.1
30	18	0.52	10	113	---	25	63	2.8	180	7.2	0.64	1.0
31	20	---	e8.7	125	---	23	---	2.4	---	6.0	0.56	---
Total	84.18	110.46	426.20	1,064.9	676.7	2,372	1,127.9	404.5	483.2	1,658.2	134.89	115.72
Mean	2.72	3.68	13.7	34.4	24.2	76.5	37.6	13.0	16.1	53.5	4.35	3.86
Max	20	20	75	132	91	284	120	41	180	223	37	29
Min	0.09	0.52	0.37	5.4	8.1	20	8.7	2.4	1.6	6.0	0.56	0.26
Cfsm	0.08	0.10	0.38	0.96	0.68	2.14	1.05	0.36	0.45	1.49	0.12	0.11
In.	0.09	0.11	0.44	1.11	0.70	2.46	1.17	0.42	0.50	1.72	0.14	0.12

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1993 - 2013, BY WATER YEAR (WY)

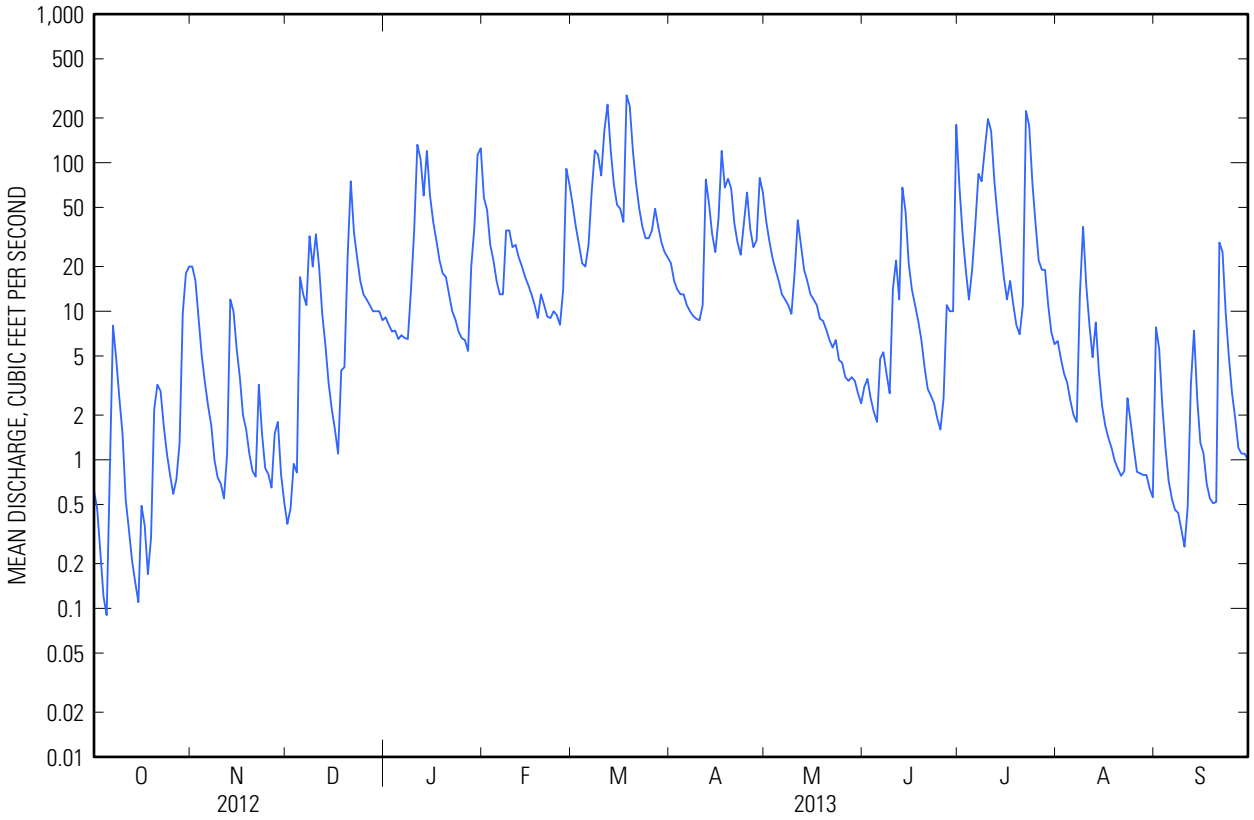
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Mean	11.7	19.3	42.7	73.3	51.5	77.4	61.2	52.9	40.4	18.1	10.5	8.28
Max	93.6	78.9	145	307	115	219	157	187	142	82.1	65.4	97.3
(WY)	(2007)	(2012)	(2012)	(2005)	(2011)	(2008)	(1996)	(1996)	(1997)	(1993)	(1995)	(2003)
Min	0.00	0.01	1.95	10.4	18.8	13.8	11.3	5.40	0.36	0.30	0.00	0.00
(WY)	(1995)	(2000)	(2000)	(2011)	(2010)	(2001)	(2012)	(1999)	(1999)	(1999)	(1999)	(1999)

03230450 HELLBRANCH RUN NEAR HARRISBURG OH—Continued

SUMMARY STATISTICS

	Calendar Year 2012		Water Year 2013		Water Years 1993 - 2013	
Annual total	6,825.18		8,658.85			
Annual mean	18.6		23.7		38.9	
Highest annual mean					66.8	1996
Lowest annual mean					21.4	2009
Highest daily mean	656	Jan 27	284	Mar 18	2,000	Jun 29, 1998
Lowest daily mean	0.00	Jul 11	0.09	Oct 5	0.00	Aug 30, 1993
Annual seven-day minimum	0.00	Jul 11	0.26	Oct 13	0.00	Sep 13, 1993
Maximum peak flow			516	Mar 18	3,180	Jun 29, 1998
Maximum peak stage			6.77	Mar 18	14.19	Jun 29, 1998
Instantaneous low flow			0.04	Oct 5[a]	0.00	Sep 23, 1993
Annual runoff (cfsm)	0.52		0.66		1.09	
Annual runoff (inches)	7.09		9.00		14.77	
10 percent exceeds	42		67		89	
50 percent exceeds	5.3		10		12	
90 percent exceeds	0.00		0.77		0.25	

[a] Also on October 19.



03230450 HELLBRANCH RUN NEAR HARRISBURG OH—Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--May 1992 to current year.

PERIOD OF DAILY RECORD.--
SUSPENDED-SEDIMENT DISCHARGE: October 1992 to current year.

INSTRUMENTATION.--Refrigerated water-quality pumping sampler since October 1992.

REMARKS.--Water-quality samples were collected by equal-width-increment (EWI) sampling method, approximately once per month. Suspended-sediment samples and seasonal-event water-quality samples were collected by pumping sampler. Pumped samples were collected for every 0.5-ft change in stage. Sediment samples were also collected at a single vertical, approximately biweekly. Suspended-sediment loads were calculated using the mean-interval method (Porterfield, George, 1972, Computation of Fluvial-Sediment Discharge: U.S. Geological Survey, Techniques of Water-Resources Investigations, book 3, chap. C3, 66 p.). For days with unsteady concentration, discharge, or both, the day was subdivided into quarter-hour intervals and the daily load was calculated by summing the loads for these quarter-hour intervals. This required interpolation between measured and estimated concentrations.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 819 mg/L, June 29, 1998, minimum daily mean, 0.0 mg/L, on many days during 2009 - 2012, on several days during 2004 and 2008, December 18 - 22, 2005, and August 14 and 15, 2007.
SEDIMENT LOADS: Maximum daily, 4,420 tons, June 29, 1998, minimum daily, 0.00 ton, on many days during 1993 - 1995, 1998, 1999, 2002, 2007 - 2013, and on several days during 1996, 1997, 2000, and 2004 - 2006.

EXTREMES FOR CURRENT YEAR.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 375 mg/L, March 18, minimum daily mean, 1 mg/L, on several days during the year.
SEDIMENT LOADS: Maximum daily, 412 tons, March 18, minimum daily, 0.00 ton, on many days during the year.

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SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY)
WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013
[e, estimated]

Day	Mean discharge (ft^3/s)	Mean concen-tration (mg/L)	Sediment discharge (tons/day)	Mean discharge (ft^3/s)	Mean concen-tration (mg/L)	Sediment discharge (tons/day)	Mean discharge (ft^3/s)	Mean concen-tration (mg/L)	Sediment discharge (tons/day)
		October			November			December	
1	0.62	2	0.00	20	4	0.23	0.37	2	0.00
2	0.47	2	0.00	16	2	0.10	0.47	1	0.00
3	0.24	2	0.00	8.9	2	0.04	0.94	1	0.00
4	0.12	2	0.00	5.0	2	0.02	0.82	1	0.00
5	0.09	2	0.00	3.3	2	0.01	17	8	0.50
6	0.85	2	0.01	2.3	1	0.01	13	7	0.24
7	8.0	6	0.14	1.7	1	0.01	11	5	0.18
8	4.8	4	0.05	1.0	1	0.00	32	15	1.3
9	2.6	3	0.02	0.76	1	0.00	20	8	0.46
10	1.5	2	0.01	0.69	1	0.00	33	14	1.3
11	0.54	2	0.00	0.55	2	0.00	20	7	0.41
12	0.34	2	0.00	1.1	2	0.01	9.6	2	0.06
13	0.21	2	0.00	12	9	0.37	5.9	2	0.03
14	0.15	2	0.00	10	7	0.21	3.3	2	0.02
15	0.11	2	0.00	5.6	5	0.08	2.2	2	0.01
16	0.49	2	0.00	3.6	4	0.04	1.6	2	0.01
17	0.36	2	0.00	2.0	3	0.02	1.1	3	0.01
18	0.17	2	0.00	1.6	3	0.01	4.0	3	0.03
19	0.30	2	0.00	1.1	3	0.01	4.2	3	0.03
20	2.2	3	0.02	0.84	2	0.01	23	49	8.1
21	3.2	4	0.04	0.77	2	0.00	75	66	15
22	2.9	4	0.03	3.2	5	0.06	34	33	3.0
23	1.7	3	0.02	1.5	4	0.02	23	24	1.5
24	1.1	3	0.01	0.88	3	0.01	16	18	0.81
25	0.79	3	0.01	0.80	2	0.00	13	13	0.45
26	0.59	2	0.00	0.65	2	0.00	12	9	0.29
27	0.74	2	0.00	1.5	3	0.02	11	9	0.27
28	1.3	2	0.01	1.8	4	0.02	10	9	0.24
29	9.7	7	0.24	0.80	2	0.00	10	9	0.24
30	18	10	0.51	0.52	2	0.00	10	8	0.23
31	20	7	0.38	---	---	---	e8.7	8	0.19
Total	84.18	---	1.50	110.46	---	1.31	426.20	---	34.91

03230450 HELLBRANCH RUN NEAR HARRISBURG OH—Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY)
WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013
[e, estimated]

Day	Mean discharge (ft³/s)	Mean concen-tration (mg/L)	Sediment discharge (tons/day)	Mean discharge (ft³/s)	Mean concen-tration (mg/L)	Sediment discharge (tons/day)	Mean discharge (ft³/s)	Mean concen-tration (mg/L)	Sediment discharge (tons/day)
		January			February			March	
1	e9.1	8	0.20	58	26	4.2	52	20	2.8
2	e8.1	8	0.18	48	20	2.8	37	17	1.7
3	e7.3	8	0.16	28	14	1.1	28	17	1.2
4	e7.4	8	0.15	e22	13	0.76	21	16	0.90
5	e6.5	8	0.13	e16	11	0.49	20	16	0.83
6	e6.9	7	0.14	e13	9	0.32	28	17	1.3
7	e6.6	7	0.13	e13	8	0.28	64	33	7.1
8	e6.5	7	0.13	35	16	1.6	121	56	19
9	14	9	0.44	35	14	1.3	113	50	16
10	35	27	2.6	27	10	0.76	82	30	6.8
11	132	163	81	28	9	0.66	165	203	153
12	106	106	35	23	7	0.47	246	297	215
13	60	29	5.4	20	7	0.35	121	86	29
14	120	93	32	17	7	0.31	71	35	6.9
15	60	37	6.1	15	7	0.26	52	27	3.7
16	40	21	2.3	13	7	0.22	49	24	3.2
17	30	11	0.86	e11	6	0.19	40	22	2.4
18	22	5	0.32	e9.0	6	0.15	284	375	412
19	18	5	0.24	13	6	0.21	240	261	176
20	17	5	0.21	11	6	0.18	120	114	39
21	13	5	0.16	9.2	6	0.14	72	50	9.9
22	e10	5	0.12	9.0	6	0.14	49	44	5.8
23	e8.8	4	0.11	10	5	0.15	37	40	4.0
24	e7.3	4	0.09	9.4	5	0.14	31	36	3.0
25	e6.6	4	0.08	8.1	5	0.11	31	31	2.6
26	e6.4	4	0.07	14	9	0.57	35	28	2.8
27	e5.4	4	0.06	91	66	16	49	35	4.7
28	e20	7	0.36	71	34	6.6	37	28	2.7
29	37	12	1.2	---	---	---	29	24	1.9
30	113	84	36	---	---	---	25	22	1.4
31	125	74	27	---	---	---	23	20	1.3
Total	1,064.9	---	232.94	676.7	---	40.46	2,372	---	1,137.93

03230450 HELLBRANCH RUN NEAR HARRISBURG OH—Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY)
WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013
[e, estimated]

Day	Mean discharge (ft^3/s)	Mean concen-tration (mg/L)	Sediment discharge (tons/day)	Mean discharge (ft^3/s)	Mean concen-tration (mg/L)	Sediment discharge (tons/day)	Mean discharge (ft^3/s)	Mean concen-tration (mg/L)	Sediment discharge (tons/day)
		April			May			June	
1	21	19	1.1	41	25	2.8	3.1	9	0.08
2	16	18	0.79	30	19	1.5	3.5	9	0.09
3	14	17	0.64	23	16	1.0	2.6	9	0.06
4	13	16	0.57	19	13	0.67	2.1	9	0.05
5	13	16	0.53	16	11	0.45	1.8	8	0.04
6	11	15	0.43	13	9	0.35	4.8	8	0.10
7	10	14	0.38	12	9	0.29	5.3	8	0.11
8	9.3	13	0.34	11	8	0.24	3.8	8	0.08
9	8.9	13	0.31	9.6	7	0.19	2.8	7	0.05
10	8.7	13	0.30	18	13	0.83	14	15	0.78
11	11	14	0.42	41	28	3.1	22	15	0.95
12	77	35	7.8	28	17	1.3	12	10	0.33
13	53	24	3.6	19	12	0.64	68	79	20
14	33	16	1.4	16	10	0.43	47	34	4.9
15	25	13	0.87	13	10	0.38	21	19	1.1
16	42	30	8.5	12	11	0.35	14	18	0.69
17	120	72	24	11	11	0.31	11	18	0.52
18	68	41	7.7	8.9	11	0.27	8.6	18	0.41
19	78	51	12	8.6	12	0.27	6.4	17	0.30
20	67	40	7.6	7.5	12	0.24	4.2	17	0.19
21	39	20	2.1	6.4	12	0.21	3.0	17	0.13
22	29	15	1.2	5.7	13	0.19	2.7	16	0.12
23	24	12	0.81	6.4	13	0.22	2.4	16	0.10
24	39	25	3.9	4.7	13	0.17	1.9	15	0.08
25	63	38	6.9	4.5	13	0.16	1.6	15	0.07
26	36	14	1.4	3.6	14	0.13	2.6	15	0.10
27	27	10	0.74	3.4	14	0.13	11	14	0.43
28	30	12	0.98	3.6	14	0.14	10	13	0.37
29	79	60	14	3.4	15	0.14	10	11	0.31
30	63	39	6.7	2.8	13	0.10	180	322	193
31	---	---	---	2.4	10	0.06	---	---	---
Total	1,127.9	---	118.01	404.5	---	17.26	483.2	---	225.54

03230450 HELLBRANCH RUN NEAR HARRISBURG OH—Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY)
WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013
[e, estimated]

Day	Mean discharge (ft³/s)	Mean concen-tration (mg/L)	Sediment discharge (tons/day)	Mean discharge (ft³/s)	Mean concen-tration (mg/L)	Sediment discharge (tons/day)	Mean discharge (ft³/s)	Mean concen-tration (mg/L)	Sediment discharge (tons/day)
		July			August			September	
1	69	57	12	6.3	9	0.16	7.8	7	0.18
2	33	25	2.3	4.8	8	0.11	5.6	5	0.07
3	19	14	0.73	3.8	8	0.08	2.3	3	0.02
4	12	9	0.31	3.3	7	0.06	1.2	3	0.01
5	19	16	0.97	2.5	6	0.04	0.72	4	0.01
6	38	37	7.9	2.0	5	0.03	0.55	4	0.01
7	84	74	20	1.8	4	0.02	0.46	5	0.01
8	75	54	16	13	15	2.1	0.44	6	0.01
9	123	75	28	37	43	4.6	0.34	6	0.01
10	197	118	70	15	15	0.66	0.26	7	0.00
11	163	67	33	8.1	7	0.17	0.48	7	0.01
12	76	30	6.4	4.9	5	0.06	3.2	6	0.06
13	44	18	2.2	8.4	7	0.18	7.4	8	0.18
14	27	15	1.1	3.9	5	0.05	2.6	4	0.03
15	17	12	0.56	2.3	4	0.02	1.3	3	0.01
16	12	11	0.36	1.7	4	0.02	1.1	3	0.01
17	16	13	0.59	1.4	4	0.01	0.69	2	0.00
18	11	11	0.33	1.2	4	0.01	0.55	2	0.00
19	8.0	10	0.21	0.98	3	0.01	0.51	2	0.00
20	7.0	10	0.18	0.87	3	0.01	0.52	3	0.00
21	11	9	0.28	0.78	3	0.01	29	22	2.7
22	223	137	135	0.84	3	0.01	25	14	1.1
23	177	63	33	2.6	4	0.03	9.7	6	0.17
24	74	29	6.0	1.8	4	0.02	4.9	4	0.06
25	39	19	2.0	1.2	3	0.01	2.8	4	0.03
26	22	14	0.85	0.83	3	0.01	1.9	4	0.02
27	19	14	0.69	0.81	3	0.01	1.2	4	0.01
28	19	13	0.66	0.79	3	0.01	1.1	3	0.01
29	11	12	0.35	0.79	4	0.01	1.1	3	0.01
30	7.2	11	0.22	0.64	4	0.01	1.0	3	0.01
31	6.0	10	0.17	0.56	4	0.01	---	---	---
Total	1,658.2	---	382.36	134.89	---	8.54	115.72	---	4.75

	Total discharge (ft³/s)	Total suspended sediment discharge (tons)
Year	8,658.85	2,205.51