Water-Data Report 2011

03339000 VERMILION RIVER NEAR DANVILLE, IL

Wabash Basin
Vermilion Subbasin

LOCATION.--Lat 40°06′03″, long 87°35′50″ referenced to North American Datum of 1927, in NW ¼ NW ¼ sec.22, T.19 N., R.11 W., Vermilion County, IL, Hydrologic Unit 05120109, on right bank at Danville sewage-treatment plant, 1.7 miles upstream from Stony Creek, 2.2 miles southeast of Danville, and at mile 19.5

DRAINAGE AREA.--1,290 mi^2.

SURFACE-WATER RECORDS

PERIOD OF RECORD.—
SURFACE-WATER DISCHARGE AND STAGE
DISCHARGE: October 1914 to September 1921, June 1928 to current year. Monthly discharge only for some periods, published in WSP 1305.
STAGE: Water years 1994 to current year.
SURFACE-WATER QUALITY
CHEMICAL: Water years 1978-91.
DISSOLVED OXYGEN: Water years 2001-2003.
PH: Water years 2001-2003.
SEDIMENT: March 2011 to current year.
SPECIFIC CONDUCTANCE: Water years 2001-2003.
TURBIDITY: Water years 2001-2003.
WATER TEMPERATURE: Water years 2001-2003.

REVISED RECORDS.-- WSP 853: 1936(M). WSP 973: 1939. WSP 1305: 1915-16, 1920, 1929. WSP1335: 1934(m). WSP 1909: 1960. WDR IL-75-1: Drainage area. WDRIL-84-1: 1983. WDR IL-92-1: 1991.

GAGE.-- Water-stage recorder, satellite telemeter, automated sediment sampler, and crest-stage gage. Datum of gage is 503.74 ft above NGVD of 1929 (503.59 ft NAVD 1988) from Aug. 30, 1982 to present. However, datum incorrectly published as 503.33 ft above NGVD of 1929 from Aug. 30, 1982 to Sept. 30, 2001. Prior to Jan. 9, 1935, nonrecording gage at same site and datum 503.33 ft. above NGVD of 1929 (levels by U.S. Army Corps of Engineers) (503.18 ft NAVD 1988). However, datum incorrectly published as 503.99 ft above NGVD of 1929 from 1928 to 1943. Jan. 9, 1935 to Aug. 30, 1982, at site 0.3 mi downstream and datum 503.33 ft above NGVD of 1929 (503.18 ft NAVD 1988).

REMARKS.--Discharge records fair except for estimated daily discharges, which are poor. Effluent from sewage-treatment plant 0.5 downstream from gage is included in discharge records. Flow regulated at times by storage at Lake Vermilion on North Fork Vermilion River, 4.5 mi upstream from station, usable capacity, 7,440 acre-ft, and by Danville sewage-treatment plant.

EXTREMES FOR PERIOD OF RECORD.--
SURFACE-WATER DISCHARGE AND STAGE: Maximum discharge, 48,700 ft^3/s, March 13, 1939, gage height, 28.59 ft; maximum gage height, 31.56 ft, Apr. 13, 1994, discharge 47,900 ft^3/s, minimum daily, 2.0 ft^3/s, Oct. 9-14, 1920 and Aug. 10, 1930.
SUSPENDED-SEDIMENT CONCENTRATIONS: Maximum daily, 861 mg/L, April 28, 2011; minimum daily, 18 mg/L, many days.
SUSPENDED-SEDIMENT LOADS: Maximum daily, 38,900 tons, April 28, 2011; minimum daily, 2.0 tons, Sept. 8, 2011.

03339000 VERMILION RIVER NEAR DANVILLE, IL—Continued

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2010 TO SEPTEMBER 2011
DAILY MEAN VALUES
[e, estimated]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	57	73	906	4,240	e210	5,320	664	4,580	3,220	701	112	51
2	55	76	667	2,840	e190	3,520	668	3,480	2,470	830	105	49
3	56	76	482	1,660	e180	2,480	523	2,800	2,030	819	88	50
4	57	68	418	1,400	e170	2,040	701	2,300	1,760	619	86	53
5	69	66	333	946	e210	3,590	673	1,960	1,670	507	80	51
6	59	70	e280	e800	e250	5,520	543	1,820	1,840	480	81	47
7	55	74	e230	e680	e270	3,990	561	1,930	1,710	e400	85	42
8	56	80	e200	e560	e260	3,000	687	3,090	1,390	728	80	40
9	57	78	e180	e440	e230	3,120	1,010	2,520	1,190	454	78	61
10	54	67	e190	e420	e190	3,950	942	1,910	1,150	433	74	60
11	54	60	e250	e460	e160	3,130	1,110	1,580	1,400	336	93	83
12	50	61	e1,400	e370	e210	2,420	1,510	1,380	1,320	341	73	83
13	56	63	e2,000	e330	e250	1,930	1,380	1,280	1,080	279	72	60
14	62	62	e1,400	e320	e290	1,640	1,090	1,450	929	255	78	51
15	53	60	e1,100	e310	635	1,760	938	2,550	1,160	248	77	72
16	69	61	e920	e305	1,460	2,300	957	3,080	2,000	226	86	72
17	57	64	e720	e300	5,410	2,040	927	2,650	1,890	212	81	76
18	54	74	e610	e290	8,180	1,760	819	1,930	1,330	204	69	77
19	53	67	e510	e340	5,690	1,430	1,910	1,530	1,140	189	61	69
20	61	62	e450	e310	3,430	1,260	7,900	1,320	1,060	164	64	66
21	67	60	e400	e270	3,900	1,250	7,430	1,210	1,300	141	72	74
22	63	61	e360	e230	5,130	1,170	6,340	1,110	1,090	146	73	72
23	59	105	e340	e210	3,610	1,150	9,190	1,070	1,010	133	65	63
24	60	166	e310	e230	2,780	1,070	8,750	1,030	836	133	86	61
25	62	395	e280	e260	2,530	893	6,560	1,300	723	146	178	64
26	69	1,060	e260	e255	2,150	853	e9,200	5,380	668	233	130	95
27	69	915	e240	e250	2,120	791	11,800	7,210	814	168	86	108
28	117	514	e230	e250	4,590	726	16,500	6,800	1,110	144	75	126
29	107	390	e220	e245	---	688	14,800	10,600	923	128	69	170
30	77	391	369	e240	---	665	7,470	8,410	708	123	60	101
31	65	---	2,990	e230	---	664	---	5,210	---	117	54	---
Total	1,959	5,419	19,245	19,991	54,685	66,120	123,553	94,470	40,921	10,037	2,571	2,147
Mean	63.2	181	621	645	1,953	2,133	4,118	3,047	1,364	324	82.9	71.6
Max	117	1,060	2,990	4,240	8,180	5,520	16,500	10,600	3,220	830	178	170
Min	50	60	180	210	160	664	523	1,030	668	117	54	40
Cfsm	0.05	0.14	0.48	0.50	1.51	1.65	3.19	2.36	1.06	0.25	0.06	0.06
In.	0.06	0.16	0.55	0.58	1.58	1.91	3.56	2.72	1.18	0.29	0.07	0.06

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1915 - 2011, BY WATER YEAR (WY)

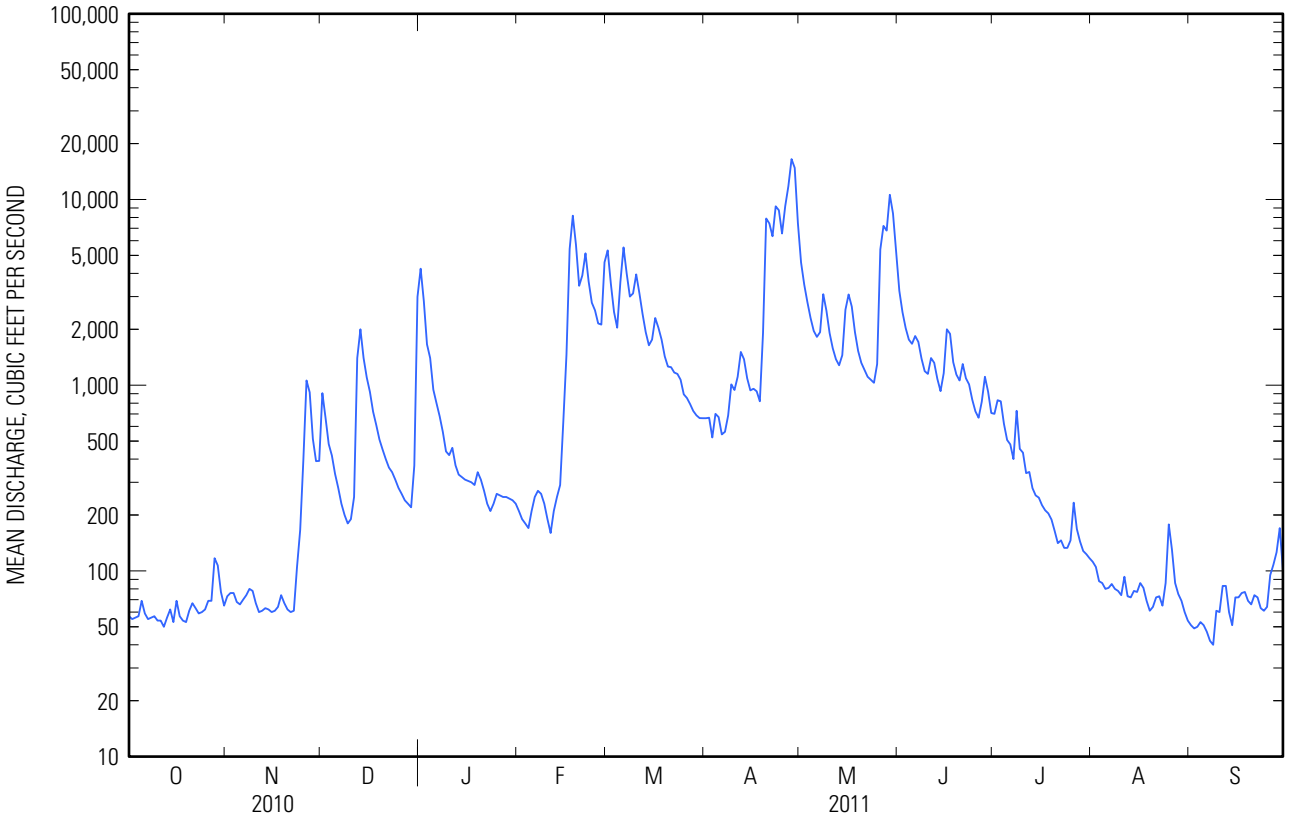
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Mean	360	632	958	1,215	1,484	1,752	1,870	1,710	1,314	775	405	284
Max	3,346	5,743	3,593	6,930	5,043	5,383	6,846	7,615	5,290	4,008	3,049	2,891
(WY)	(1978)	(1986)	(1991)	(1950)	(2008)	(1979)	(1994)	(1943)	(1998)	(1993)	(1979)	(2003)
Min	12.8	22.8	27.3	27.8	39.6	59.6	190	83.7	43.3	26.6	17.9	14.4
(WY)	(1921)	(1921)	(1915)	(1977)	(1931)	(1931)	(1915)	(1934)	(1934)	(1934)	(1930)	(1920)

03339000 VERMILION RIVER NEAR DANVILLE, IL—Continued

SUMMARY STATISTICS

	Calendar Year 2010		Water Year 2011		Water Years 1915 - 2011	
Annual total	444,802		441,118			
Annual mean	1,219		1,209		1,060	
Highest annual mean					2,694	1993
Lowest annual mean					139	1954
Highest daily mean	12,000	Jun 16	16,500	Apr 28	45,100	Apr 13, 1994
Lowest daily mean	50	Oct 12	40	Sep 8	2.0	A
Annual seven-day minimum	55	Oct 7	47	Sep 2	2.1	Oct 8, 1920
Maximum peak flow			17,900	Apr 28	[B]48,700	Mar 13, 1939
Maximum peak stage			19.69	Apr 28	[C]31.56	Apr 13, 1994
Instantaneous low flow			29	Sep 8		
Annual runoff (cfsm)	0.945		0.937		0.822	
Annual runoff (inches)	12.83		12.72		11.17	
10 percent exceeds	3,050		3,120		2,540	
50 percent exceeds	661		340		422	
90 percent exceeds	63		61		54	

[A] Oct. 9-14, 1920 and Aug. 10, 1930.
[B] Gage height, 28.59 ft.
[C] Discharge, 47,900 ft³/s.

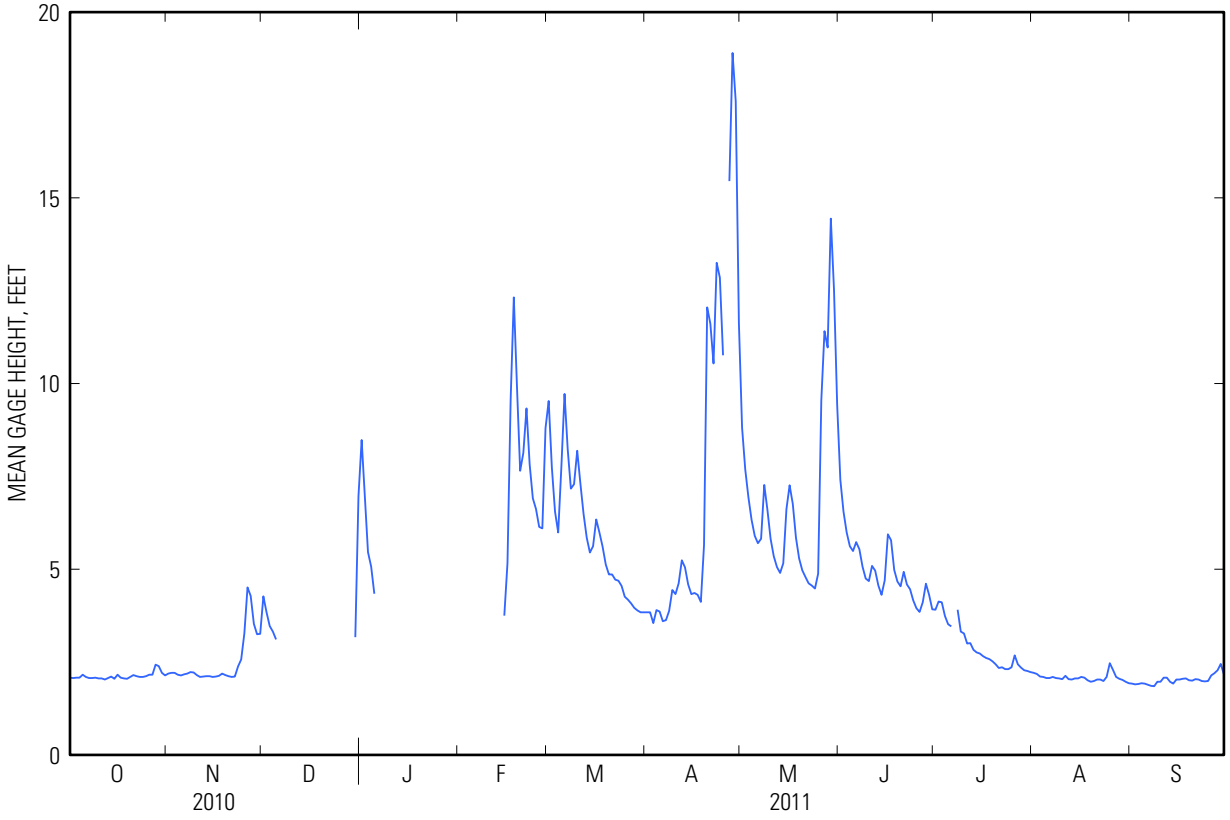


03339000 VERMILION RIVER NEAR DANVILLE, IL—Continued

GAGE HEIGHT, FEET
WATER YEAR OCTOBER 2010 TO SEPTEMBER 2011
DAILY MEAN VALUES

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	2.08	2.19	4.27	8.48	---	9.53	3.84	8.82	7.41	3.91	2.21	1.92
2	2.07	2.21	3.84	6.97	---	7.74	3.84	7.69	6.55	4.13	2.18	1.90
3	2.08	2.21	3.47	5.46	---	6.55	3.55	6.94	5.99	4.11	2.11	1.91
4	2.08	2.16	3.32	5.07	---	5.99	3.90	6.33	5.62	3.74	2.10	1.93
5	2.16	2.14	3.11	4.34	---	7.75	3.86	5.90	5.49	3.52	2.07	1.92
6	2.10	2.17	---	---	---	9.72	3.60	5.70	5.73	3.46	2.07	1.89
7	2.07	2.19	---	---	---	8.23	3.63	5.82	5.54	---	2.10	1.86
8	2.07	2.23	---	---	---	7.17	3.88	7.27	5.07	3.91	2.07	1.85
9	2.08	2.22	---	---	---	7.29	4.44	6.60	4.75	3.32	2.06	1.97
10	2.06	2.15	---	---	---	8.19	4.33	5.82	4.68	3.27	2.04	1.97
11	2.06	2.10	---	---	---	7.31	4.62	5.35	5.09	3.00	2.13	2.08
12	2.03	2.11	---	---	---	6.49	5.24	5.06	4.96	3.01	2.04	2.08
13	2.07	2.12	---	---	---	5.85	5.05	4.90	4.56	2.83	2.03	1.97
14	2.11	2.12	---	---	---	5.45	4.59	5.16	4.31	2.76	2.06	1.92
15	2.05	2.10	---	---	3.75	5.62	4.33	6.62	4.70	2.73	2.06	2.03
16	2.16	2.11	---	---	5.16	6.34	4.36	7.26	5.94	2.66	2.10	2.03
17	2.08	2.13	---	---	9.56	5.99	4.31	6.76	5.78	2.61	2.08	2.05
18	2.06	2.19	---	---	12.32	5.61	4.12	5.85	4.98	2.58	2.01	2.06
19	2.05	2.15	---	---	9.91	5.13	5.65	5.29	4.67	2.52	1.97	2.01
20	2.10	2.12	---	---	7.65	4.86	12.05	4.97	4.54	2.44	1.99	2.00
21	2.15	2.10	---	---	8.13	4.86	11.61	4.79	4.93	2.34	2.03	2.04
22	2.12	2.11	---	---	9.33	4.72	10.54	4.62	4.59	2.36	2.03	2.03
23	2.10	2.38	---	---	7.82	4.69	13.25	4.56	4.46	2.31	1.99	1.99
24	2.10	2.57	---	---	6.91	4.55	12.85	4.48	4.16	2.31	2.10	1.98
25	2.12	3.27	---	---	6.62	4.26	10.76	4.88	3.95	2.36	2.47	1.99
26	2.16	4.51	---	---	6.14	4.18	---	9.55	3.85	2.68	2.29	2.14
27	2.16	4.28	---	---	6.10	4.08	15.45	11.41	4.11	2.44	2.10	2.20
28	2.43	3.53	---	---	8.80	3.96	18.90	10.97	4.61	2.35	2.05	2.28
29	2.39	3.25	---	---	---	3.89	17.60	14.44	4.31	2.28	2.02	2.45
30	2.21	3.26	3.17	---	---	3.84	11.63	12.53	3.92	2.26	1.97	2.17
31	2.14	---	6.97	---	---	3.84	---	9.43	---	2.23	1.93	---
Mean	2.12	2.48	---	---	---	5.93	---	6.96	4.97	---	2.08	2.02
Max	2.43	4.51	---	---	---	9.72	---	14.44	7.41	---	2.47	2.45
Min	2.03	2.10	---	---	---	3.84	---	4.48	3.85	---	1.93	1.85

03339000 VERMILION RIVER NEAR DANVILLE, IL—Continued



03339000 VERMILION RIVER NEAR DANVILLE, IL—Continued

WATER-QUALITY RECORDS

EXTREMES FOR CURRENT YEAR.--

SUSPENDED-SEDIMENT CONCENTRATIONS: Maximum daily, 861 mg/L, April 28; minimum daily, 18 mg/L, many days.

SUSPENDED-SEDIMENT LOADS: Maximum daily, 38,900 tons, April 28; minimum daily, 2.0 tons, Sept. 8.

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY)
WATER YEAR OCTOBER 2010 TO SEPTEMBER 2011

[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	57	---	---	73	---	---	906	---	---
2	55	---	---	76	---	---	667	---	---
3	56	---	---	76	---	---	482	---	---
4	57	---	---	68	---	---	418	---	---
5	69	---	---	66	---	---	333	---	---
6	59	---	---	70	---	---	e280	---	---
7	55	---	---	74	---	---	e230	---	---
8	56	---	---	80	---	---	e200	---	---
9	57	---	---	78	---	---	e180	---	---
10	54	---	---	67	---	---	e190	---	---
11	54	---	---	60	---	---	e250	---	---
12	50	---	---	61	---	---	e1,400	---	---
13	56	---	---	63	---	---	e2,000	---	---
14	62	---	---	62	---	---	e1,400	---	---
15	53	---	---	60	---	---	e1,100	---	---
16	69	---	---	61	---	---	e920	---	---
17	57	---	---	64	---	---	e720	---	---
18	54	---	---	74	---	---	e610	---	---
19	53	---	---	67	---	---	e510	---	---
20	61	---	---	62	---	---	e450	---	---
21	67	---	---	60	---	---	e400	---	---
22	63	---	---	61	---	---	e360	---	---
23	59	---	---	105	---	---	e340	---	---
24	60	---	---	166	---	---	e310	---	---
25	62	---	---	395	---	---	e280	---	---
26	69	---	---	1,060	---	---	e260	---	---
27	69	---	---	915	---	---	e240	---	---
28	117	---	---	514	---	---	e230	---	---
29	107	---	---	390	---	---	e220	---	---
30	77	---	---	391	---	---	369	---	---
31	65	---	---	---	---	---	2,990	---	---
Total	1,959	---	---	5,419	---	---	19,245	---	---

03339000 VERMILION RIVER NEAR DANVILLE, IL—Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY)
WATER YEAR OCTOBER 2010 TO SEPTEMBER 2011
[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	4,240	---	---	e210	---	---	5,320	---	---
2	2,840	---	---	e190	---	---	3,520	---	---
3	1,660	---	---	e180	---	---	2,480	---	---
4	1,400	---	---	e170	---	---	2,040	---	---
5	946	---	---	e210	---	---	3,590	---	---
6	e800	---	---	e250	---	---	5,520	---	---
7	e680	---	---	e270	---	---	3,990	---	---
8	e560	---	---	e260	---	---	3,000	---	---
9	e440	---	---	e230	---	---	3,120	---	---
10	e420	---	---	e190	---	---	3,950	---	---
11	e460	---	---	e160	---	---	3,130	---	---
12	e370	---	---	e210	---	---	2,420	---	---
13	e330	---	---	e250	---	---	1,930	---	---
14	e320	---	---	e290	---	---	1,640	---	---
15	e310	---	---	635	---	---	1,760	29	140
16	e305	---	---	1,460	---	---	2,300	31	191
17	e300	---	---	5,410	---	---	2,040	30	167
18	e290	---	---	8,180	---	---	1,760	30	143
19	e340	---	---	5,690	---	---	1,430	30	115
20	e310	---	---	3,430	---	---	1,260	29	100
21	e270	---	---	3,900	---	---	1,250	29	99
22	e230	---	---	5,130	---	---	1,170	29	93
23	e210	---	---	3,610	---	---	1,150	30	92
24	e230	---	---	2,780	---	---	1,070	30	86
25	e260	---	---	2,530	---	---	893	30	72
26	e255	---	---	2,150	---	---	853	30	70
27	e250	---	---	2,120	---	---	791	30	65
28	e250	---	---	4,590	---	---	726	31	60
29	e245	---	---	---	---	---	688	31	57
30	e240	---	---	---	---	---	665	31	56
31	e230	---	---	---	---	---	664	31	56
Total	19,991	---	---	54,685	---	---	66,120	---	---

03339000 VERMILION RIVER NEAR DANVILLE, IL—Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY)
WATER YEAR OCTOBER 2010 TO SEPTEMBER 2011
[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)
		April			May			June	
1	664	31	56	4,580	108	1,350	3,220	102	897
2	668	32	57	3,480	72	681	2,470	77	518
3	523	32	45	2,800	64	487	2,030	71	392
4	701	32	61	2,300	61	377	1,760	68	326
5	673	33	59	1,960	47	248	1,670	66	296
6	543	33	48	1,820	44	217	1,840	63	311
7	561	34	51	1,930	93	564	1,710	60	276
8	687	34	63	3,090	610	5,200	1,390	57	213
9	1,010	35	94	2,520	326	2,300	1,190	54	173
10	942	36	92	1,910	118	609	1,150	51	158
11	1,110	42	127	1,580	95	407	1,400	48	182
12	1,510	46	188	1,380	78	291	1,320	45	161
13	1,380	44	165	1,280	86	299	1,080	42	123
14	1,090	42	124	1,450	98	384	929	39	99
15	938	40	101	2,550	266	1,940	1,160	89	290
16	957	38	97	3,080	442	3,680	2,000	124	662
17	927	35	88	2,650	302	2,180	1,890	83	428
18	819	24	54	1,930	166	872	1,330	67	242
19	1,910	124	1,090	1,530	107	447	1,140	51	157
20	7,900	568	12,300	1,320	79	283	1,060	51	149
21	7,430	417	8,490	1,210	51	166	1,300	63	220
22	6,340	310	5,490	1,110	35	106	1,090	57	168
23	9,190	473	11,900	1,070	32	94	1,010	49	135
24	8,750	300	7,200	1,030	30	82	836	42	95
25	6,560	170	3,030	1,300	188	844	723	34	68
26	e9,200	342	8,470	5,380	612	9,200	668	31	56
27	11,800	446	14,300	7,210	422	8,350	814	43	98
28	16,500	861	38,900	6,800	514	10,100	1,110	54	162
29	14,800	439	18,100	10,600	851	24,300	923	36	89
30	7,470	171	3,580	8,410	502	11,800	708	25	49
31	---	---	---	5,210	154	2,210	---	---	---
Total	123,553	---	134,420	94,470	---	90,068	40,921	---	7,193

03339000 VERMILION RIVER NEAR DANVILLE, IL—Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY)
WATER YEAR OCTOBER 2010 TO SEPTEMBER 2011
[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)
		July			August			September	
1	701	32	62	112	20	6.2	51	18	2.5
2	830	42	94	105	20	5.8	49	18	2.4
3	819	41	94	88	20	4.8	50	18	2.4
4	619	34	58	86	20	4.7	53	18	2.6
5	507	30	42	80	20	4.4	51	18	2.5
6	480	28	36	81	20	4.4	47	18	2.3
7	e400	27	30	85	20	4.6	42	18	2.1
8	728	41	83	80	20	4.3	40	18	2.0
9	454	28	35	78	20	4.2	61	18	3.0
10	433	26	30	74	20	4.0	60	18	2.9
11	336	25	22	93	20	5.0	83	19	4.2
12	341	23	21	73	20	3.9	83	19	4.2
13	279	22	17	72	20	3.8	60	18	3.0
14	255	22	15	78	20	4.2	51	18	2.5
15	248	22	15	77	20	4.1	72	18	3.5
16	226	22	13	86	20	4.5	72	18	3.5
17	212	22	12	81	19	4.2	76	18	3.7
18	204	21	12	69	19	3.6	77	18	3.8
19	189	21	11	61	19	3.2	69	18	3.3
20	164	21	9.4	64	19	3.3	66	18	3.2
21	141	21	8.1	72	19	3.7	74	18	3.6
22	146	21	8.3	73	19	3.8	72	18	3.5
23	133	21	7.6	65	19	3.3	63	18	3.1
24	133	21	7.5	86	19	4.4	61	18	3.0
25	146	21	8.2	178	20	9.8	64	18	3.2
26	233	21	13	130	19	6.8	95	18	4.7
27	168	21	9.4	86	19	4.4	108	18	5.3
28	144	21	8.1	75	19	3.8	126	18	6.3
29	128	21	7.1	69	19	3.5	170	18	8.5
30	123	21	6.8	60	18	3.0	101	18	4.8
31	117	20	6.5	54	18	2.7	---	---	---
Total	10,037	---	802.0	2,571	---	136.4	2,147	---	105.6