Water-Data Report 2011

14241500 SOUTH FORK TOUTLE RIVER AT TOUTLE, WA

Lower Columbia Basin
Lower Cowlitz Subbasin

LOCATION.--Lat 46°19′20″, long 122°41′45″ referenced to North American Datum of 1927, in SE ¼ NW ¼ sec.29, T.10 N., R.1 E., Cowlitz County, WA, Hydrologic Unit 17080005, on right bank at upstream side of bridge on South Toutle Road, 3.1 mi downstream from Johnson Creek, 0.8 mi upstream from Studebaker Creek, 1.3 mi southeast of Toutle, and approximately 1.0 mi upstream from mouth.

DRAINAGE AREA.--120 mi^2.

SURFACE-WATER RECORDS

PERIOD OF RECORD.--October 1939 to December 1957, February 1996 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 460 ft above NGVD of 1929, from topographic map. Prior to Feb. 9, 1996, water-stage recorder at site 0.6 mi upstream, at datum at NGVD of 1929 (river-profile survey).

REMARKS.--Records fair. No regulation or diversion upstream from station.

AVERAGE DISCHARGE FOR PERIOD OF RECORD.--33 years (water years 1940-57, 1997-2011), 627 ft^3/s, 70.97 in/yr, 454,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, not determined Feb. 8, 1996, gage height, 28.81 ft from high-water mark; maximum gage height, 28.90 ft Nov. 7, 2006; maximum daily discharge, 17,400 ft^3/s Feb. 8, 1996; minimum discharge, 61 ft^3/s Sept. 3-6, 2003.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Jan. 9, 1990, produced discharge of 19,200 ft^3/s as recorded at station 14241490, 2.2 mi upstream. A flood believed to be in excess of 100,000 ft^3/s (from Ph.d. thesis by Fairchild, U. Wash., 1985) occurred at about 1000 hours on May 18, 1980, from a mudflow caused by the eruption of Mount St. Helens.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 4,200 ft^3/s and (or) maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)
Jan 16	1515	*6,710	*25.90
Mar 10	0845	4,580	24.98

Minimum discharge, 80 ft^3/s, Sept. 12, gage height, 20.96 ft.

Suggested citation: U.S. Geological Survey, 2012, Water-resources data for the United States, Water Year 2011: U.S. Geological Survey Water-Data Report WDR-US-2011, site 14241500, accessed at http://wdr.water.usgs.gov/wy2011/pdfs/14241500.2011.pdf

14241500 SOUTH FORK TOUTLE RIVER AT TOUTLE, WA—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	123	1,380	1,710	938	781	911	2,050	1,010	764	388	144	94
2	120	2,170	1,310	815	689	1,120	1,990	954	846	355	142	92
3	118	1,390	1,050	730	612	987	1,600	934	849	353	139	90
4	116	1,010	862	666	635	853	1,520	863	799	325	137	88
5	114	758	724	690	701	1,040	1,790	871	859	303	136	86
6	111	643	642	815	741	922	1,810	893	902	296	135	85
7	110	1,230	625	880	942	778	1,520	1,090	880	308	135	85
8	109	1,110	1,270	899	901	700	1,270	1,190	830	289	130	84
9	135	1,060	2,280	821	774	1,430	1,100	1,210	722	261	129	84
10	388	990	2,420	734	678	3,740	1,010	1,130	685	242	126	85
11	282	841	2,030	676	605	2,490	1,310	1,160	627	232	123	84
12	207	768	3,470	1,220	593	1,840	1,160	1,190	578	237	120	83
13	174	663	3,070	3,270	862	1,850	1,060	1,060	574	268	118	84
14	157	986	2,820	2,810	913	2,360	1,070	1,000	556	242	117	86
15	148	1,070	2,040	2,470	1,230	2,250	1,240	1,490	551	223	112	85
16	138	1,430	1,600	4,900	1,130	2,160	1,430	1,660	517	236	109	91
17	133	1,840	1,290	4,400	992	1,760	1,310	1,370	482	257	106	97
18	128	2,260	1,150	3,020	837	1,470	1,140	1,160	580	260	105	128
19	124	1,740	993	2,080	710	1,240	1,010	1,060	710	222	105	152
20	122	1,460	914	1,620	619	1,080	860	1,000	590	209	104	105
21	119	1,200	854	1,930	551	1,030	774	994	518	203	101	93
22	119	1,040	792	1,820	527	940	691	997	521	200	101	89
23	122	827	716	1,500	492	810	616	918	520	183	111	87
24	355	659	677	1,290	456	794	625	839	484	172	106	85
25	965	582	e750	1,160	409	783	952	818	451	168	102	93
26	1,120	706	e850	1,040	380	733	1,230	834	406	175	99	125
27	1,280	801	e1,000	943	393	843	1,290	1,090	388	162	98	155
28	808	679	2,250	879	943	924	1,400	1,210	396	157	96	126
29	680	581	1,880	1,010	---	1,070	1,290	1,020	412	152	95	106
30	552	1,220	1,390	938	---	1,750	1,130	905	444	150	97	101
31	736	---	1,120	908	---	2,240	---	822	---	149	94	---
Total	9,913	33,094	44,549	47,872	20,096	42,898	37,248	32,742	18,441	7,377	3,572	2,928
Mean	320	1,103	1,437	1,544	718	1,384	1,242	1,056	615	238	115	97.6
Max	1,280	2,260	3,470	4,900	1,230	3,740	2,050	1,660	902	388	144	155
Min	109	581	625	666	380	700	616	818	388	149	94	83
Ac-ft	19,660	65,640	88,360	94,950	39,860	85,090	73,880	64,940	36,580	14,630	7,090	5,810
Cfsm	2.66	9.19	12.0	12.9	5.98	11.5	10.3	8.80	5.12	1.98	0.96	0.81
In.	3.07	10.26	13.81	14.84	6.23	13.30	11.55	10.15	5.72	2.29	1.11	0.91

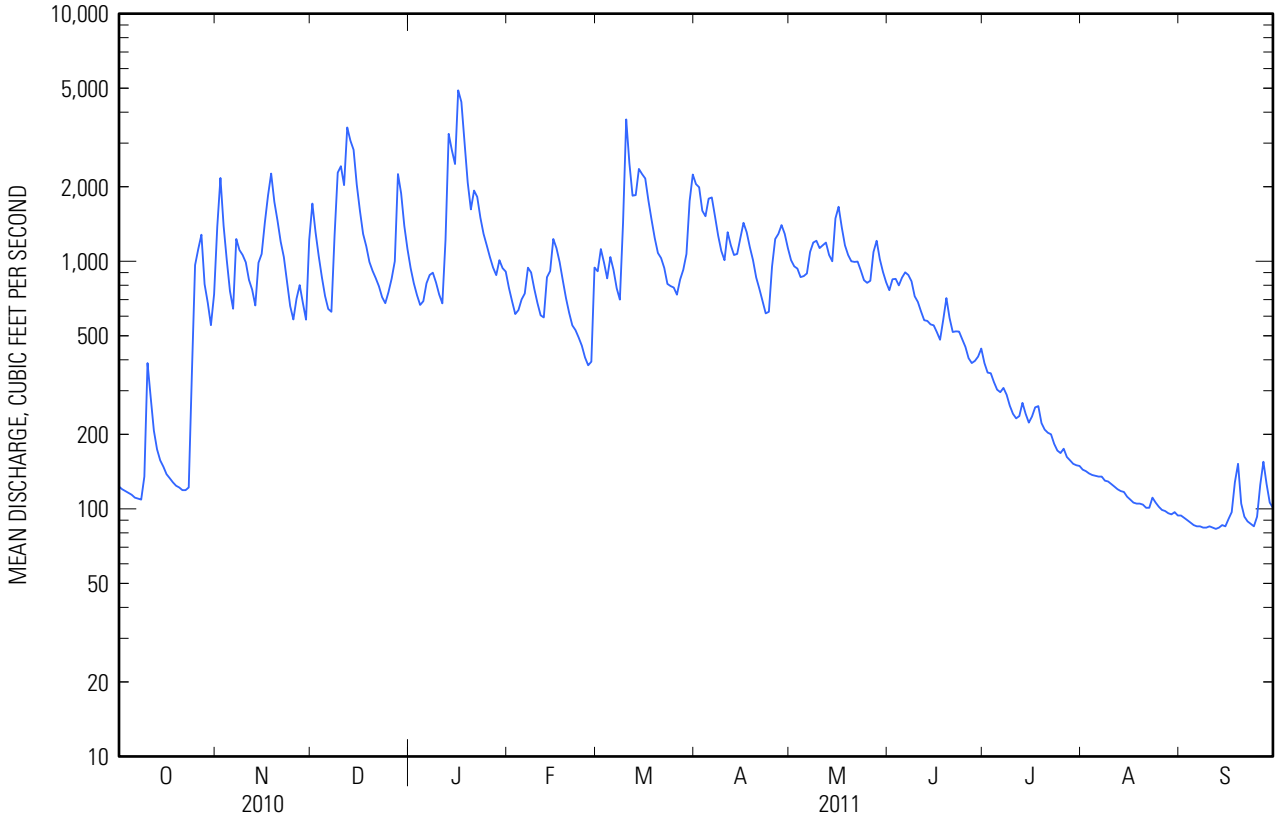
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1940 - 2011, BY WATER YEAR (WY)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Mean	341	893	1,132	1,104	991	847	764	662	424	187	117	133
Max	1,222	2,207	2,031	2,488	2,451	1,647	1,242	1,097	889	414	231	409
(WY)	(1998)	(2007)	(1997)	(1953)	(1996)	(1950)	(2011)	(1948)	(2010)	(1955)	(2004)	(1941)
Min	75.3	106	389	318	272	297	257	211	132	97.2	77.5	74.4
(WY)	(1953)	(1953)	(1945)	(2001)	(2005)	(1941)	(1941)	(1947)	(1940)	(1940)	(2003)	(2006)

14241500 SOUTH FORK TOUTLE RIVER AT TOUTLE, WA—Continued

SUMMARY STATISTICS

	Calendar Year 2010		Water Year 2011		Water Years 1940 - 2011	
Annual total	256,925		300,730			
Annual mean	704		824		627	
Highest annual mean					928	1997
Lowest annual mean					317	2001
Highest daily mean	3,470	Dec 12	4,900	Jan 16	17,400	Feb 8, 1996
Lowest daily mean	93	Sep 14	83	Sep 12	61	Oct 13, 2009
Annual seven-day minimum	98	Aug 24	84	Sep 7	64	Aug 31, 2003
Annual runoff (ac-ft)	509,600		596,500		454,100	
Annual runoff (cfsm)	5.87		6.87		5.22	
Annual runoff (inches)	79.65		93.23		70.97	
10 percent exceeds	1,390		1,720		1,320	
50 percent exceeds	625		764		431	
90 percent exceeds	118		106		98	



14241500 SOUTH FORK TOUTLE RIVER AT TOUTLE, WA—Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--February 1996 to current year.

PERIOD OF DAILY RECORD.--
SUSPENDED SEDIMENT DISCHARGE: February 1996 to March 1999, October 1999 to September 2005. Water years 1999, 2006-2011, daily sediment discharge values for period October to March, monthly sediment discharge values only for the period April to September.

INSTRUMENTATION.--Samples obtained by observer, February 1996 to September 1999. Automatic pumping sampler October 1999 to current year.

REMARKS.--Station was placed in operation after the station at South Fork Toutle River at Camp 12, near Toutle, WA (14241490) was destroyed by flood of February 1996. Current site is 2.2 miles downstream from destroyed station.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SEDIMENT CONCENTRATION: Maximum daily, 42,900 mg/L, Nov. 7, 2006; minimum daily, 1 mg/L, on many days 1996, 1998-2007, 2009, 2011.
SEDIMENT DISCHARGE: Maximum daily, 1,050,000 tons, Nov. 7, 2006; minimum daily, 0.23 tons, Sept. 25-29, 2005, Oct. 27, 28, 2006.

EXTREMES FOR CURRENT YEAR.--
SEDIMENT CONCENTRATION: Maximum daily, 1,980 mg/L (estimated) Jan. 16; minimum daily, 1 mg/L, Oct. 20-23.
SEDIMENT DISCHARGE: Maximum daily, 28,000 tons (estimated) Jan. 16. ; minimum daily, 0.32 tons, Oct. 21,22.

14241500 SOUTH FORK TOUTLE RIVER AT TOUTLE, WA—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)
		October			November			December	
1	123	3	0.96	1,380	380	2,860	1,710	101	478
2	120	3	0.91	2,170	364	2,300	1,310	31	112
3	118	3	0.85	1,390	74	289	1,050	20	57
4	116	3	0.80	1,010	25	69	862	21	50
5	114	2	0.74	758	16	33	724	17	34
6	111	2	0.68	643	18	33	642	13	23
7	110	2	0.63	1,230	53	180	625	11	18
8	109	2	0.65	1,110	16	47	1,270	83	306
9	135	5	1.9	1,060	12	36	2,280	318	2,320
10	388	38	45	990	10	27	2,420	414	2,830
11	282	10	8.2	841	10	23	2,030	194	1,090
12	207	4	2.2	768	8	17	3,470	1,600	16,000
13	174	3	1.5	663	8	14	3,070	1,780	15,600
14	157	2	0.88	986	19	53	2,820	1,420	10,700
15	148	3	1.1	1,070	16	46	2,040	1,050	5,910
16	138	3	1.0	1,430	53	206	1,600	509	2,230
17	133	2	0.85	1,840	e119	e799	1,290	307	1,070
18	128	2	0.60	2,260	e175	e1,100	1,150	259	800
19	124	2	0.53	1,740	115	542	993	210	564
20	122	1	0.33	1,460	66	266	914	153	377
21	119	1	0.32	1,200	29	95	854	107	248
22	119	1	0.32	1,040	27	75	792	75	161
23	122	1	0.38	827	36	79	716	56	108
24	355	9	9.5	659	25	45	677	43	80
25	965	e198	e609	582	19	30	e750	e34	e69
26	1,120	e250	e858	706	27	53	e850	e55	e126
27	1,280	83	329	801	21	46	e1,000	e120	e324
28	808	17	37	679	14	25	2,250	403	2,460
29	680	10	19	581	8	12	1,880	188	993
30	552	9	13	1,220	106	459	1,390	58	221
31	736	16	33	---	---	---	1,120	28	85
Total	9,913	---	1,978.83	33,094	---	9,859	44,549	---	65,444

14241500 SOUTH FORK TOUTLE RIVER AT TOUTLE, WA—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	938	18	45	781	20	43	911	29	72
2	815	14	31	689	19	35	1,120	22	67
3	730	11	22	612	22	37	987	14	38
4	666	10	17	635	27	49	853	8	20
5	690	20	38	701	27	51	1,040	11	31
6	815	29	66	741	24	48	922	6	15
7	880	28	67	942	54	138	778	5	10
8	899	17	42	901	33	82	700	4	7.7
9	821	11	24	774	26	55	1,430	104	540
10	734	7	13	678	22	40	3,740	923	9,790
11	676	3	5.7	605	23	38	2,490	249	1,820
12	1,220	96	451	593	41	68	1,840	76	379
13	3,270	684	6,270	862	47	112	1,850	53	281
14	2,810	577	4,420	913	e51	e132	2,360	130	830
15	2,470	310	2,080	1,230	e65	e215	2,250	90	543
16	4,900	e1,980	e28,000	1,130	e57	e173	2,160	58	339
17	4,400	e1,100	e13,300	992	e44	e118	1,760	37	180
18	3,020	538	4,370	837	e33	e75	1,470	20	79
19	2,080	363	2,090	710	e29	e57	1,240	12	40
20	1,620	183	805	619	e27	e45	1,080	8	23
21	1,930	228	1,270	551	e25	e37	1,030	7	20
22	1,820	171	858	527	e24	e34	940	7	18
23	1,500	66	269	492	e22	e30	810	6	14
24	1,290	40	141	456	e22	e27	794	7	15
25	1,160	27	85	409	e21	e23	783	5	10
26	1,040	23	65	380	e21	e21	733	4	7.2
27	943	24	62	393	e21	e22	843	8	19
28	879	28	67	943	e58	e156	924	11	28
29	1,010	26	71	---	---	---	1,070	15	45
30	938	20	52	---	---	---	1,750	e45	e230
31	908	23	57	---	---	---	2,240	e60	e362
Total	47,872	---	65,153.7	20,096	---	1,961	42,898	---	15,872.9

Month	Total Mean Discharge (ft³/s)	Total Sediment Discharge (tons/day)
April	37,248	935
May	32,742	226
June	18,441	225
July	7,377	80
August	3,572	32
September	2,928	28