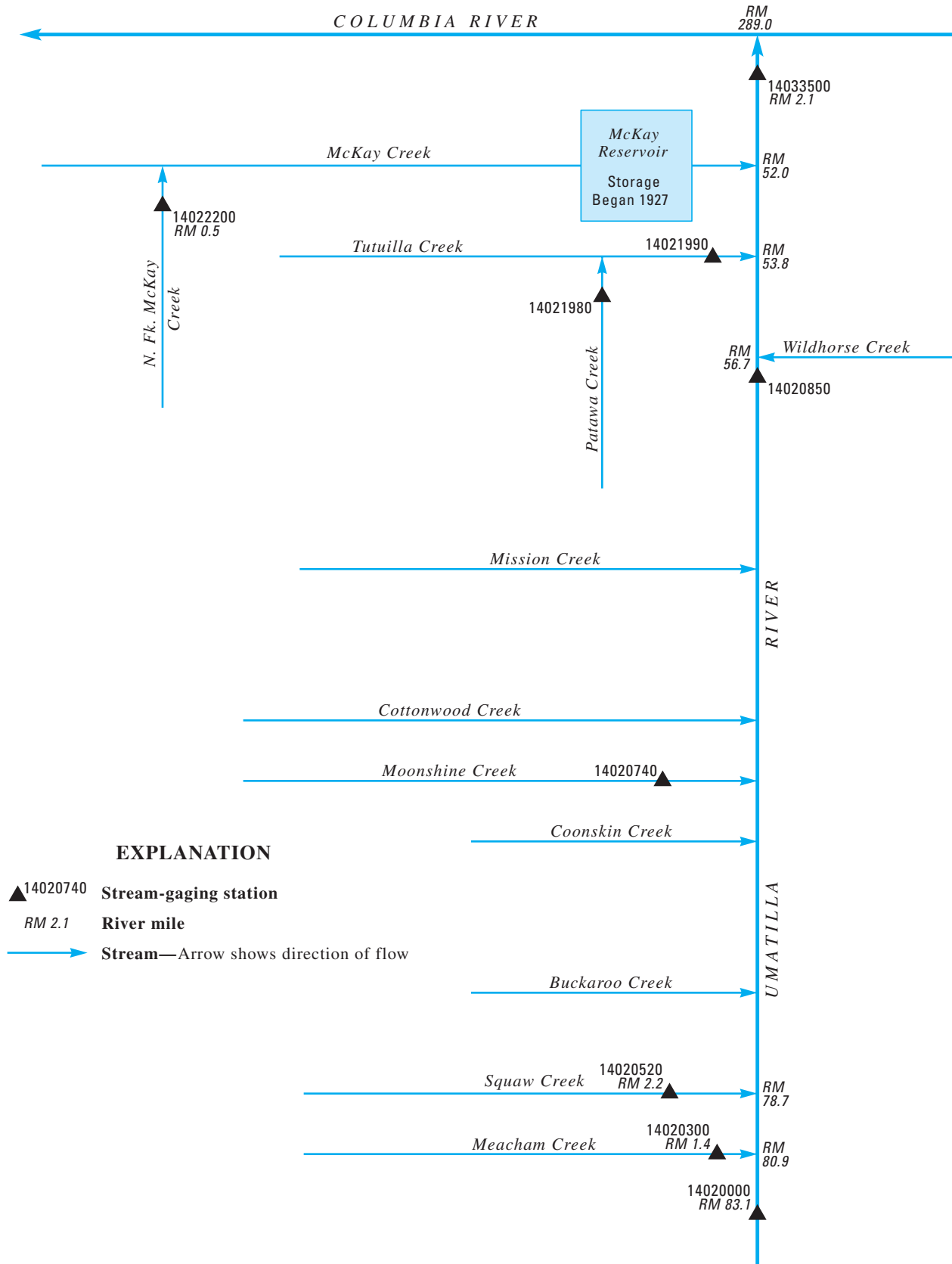


**Figure 11.** Location of surface-water stations in the Umatilla and Willow Creek Basins.



**Figure 12.** Schematic diagram showing gaging stations in the Umatilla River Basin.

14020000 UMATILLA RIVER ABOVE MEACHAM CREEK, NEAR GIBBON, OR

LOCATION.--Lat 45°43'11", long 118°19'20", in SE ¼ SW ¼ sec.21, T.3 N., R.36 E., Umatilla County, Hydrologic Unit 17070103, Umatilla Indian Reservation, on right bank 0.8 mi downstream from Ryan Creek, 2.2 mi upstream from Meacham Creek, 2.5 mi northeast of Gibbon, and at mile 83.1.

DRAINAGE AREA.--131 mi<sup>2</sup>.

PERIOD OF RECORD.--April 1933 to current year.

REVISED RECORDS.--WSP 1935: 1946-48(M), 1950(M), 1953(M), 1956-59(M), drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,854.81 ft above NGVD of 1929. Prior to June 27, 1939, at site 1 mi downstream at datum 43.94 ft lower.

REMARKS.--Records good except for estimated daily discharges, which are poor. No regulation or diversion upstream from station. Continuous water-quality records for the period June 1959 to September 1980 have been collected at this location. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--71 years (water years 1934-2004), 227 ft<sup>3</sup>/s, 23.54 in/yr, 164,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,220 ft<sup>3</sup>/s Nov. 28, 1995, gage height, 9.40 ft (high-water mark), from rating curve extended above 3,500 ft<sup>3</sup>/s; maximum gage height, 9.50 ft Jan. 29, 1965; minimum discharge, 16 ft<sup>3</sup>/s Nov. 9, 1965, momentary regulation from unknown source.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,400 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 29	1045	*1,980	*6.19	May 28	1915	1,770	5.96

Minimum discharge, 41 ft<sup>3</sup>/s, Oct. 1-6, 8, Aug. 20-22.

DISCHARGE, CUBIC FEET PER SECOND  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	42	48	217	e105	566	278	532	616	603	93	49	50
2	42	48	214	e115	406	253	422	654	476	88	49	51
3	43	49	193	e96	321	235	403	689	390	85	53	52
4	42	49	177	e54	279	258	473	674	325	82	51	51
5	42	48	158	e48	246	287	581	622	290	80	50	49
6	42	48	206	e72	232	306	568	544	276	77	50	49
7	42	48	226	e84	220	293	607	491	249	75	53	48
8	42	48	199	e96	203	347	611	465	343	74	50	48
9	43	48	171	e110	191	605	587	423	367	73	48	47
10	42	54	153	283	183	766	570	401	760	71	46	47
11	43	71	138	305	179	629	567	438	842	68	46	48
12	50	58	145	301	179	559	610	800	610	68	45	52
13	46	53	374	271	178	615	673	776	465	66	45	55
14	47	51	583	213	175	542	648	616	369	64	44	57
15	50	51	362	205	174	557	613	516	308	63	44	58
16	53	67	266	271	203	543	502	628	272	61	44	62
17	49	80	216	308	318	628	463	572	241	61	45	56
18	47	65	188	279	444	751	435	635	218	62	45	55
19	46	65	175	234	476	778	406	708	197	65	44	54
20	46	67	176	204	414	585	430	703	180	64	43	54
21	45	64	186	182	361	507	478	667	165	60	43	53
22	45	61	191	166	318	597	554	615	152	57	53	52
23	45	59	186	182	306	773	602	927	141	56	81	51
24	45	61	191	396	337	770	574	1,180	131	55	62	50
25	45	60	206	273	347	618	541	915	122	55	80	49
26	45	62	200	216	348	595	557	862	115	53	74	50
27	46	60	182	190	369	536	657	1,140	109	52	64	50
28	48	63	168	391	335	460	737	1,600	104	52	57	49
29	56	259	151	1,850	303	452	627	1,510	99	51	54	49
30	51	267	e92	1,590	---	666	598	1,090	96	50	51	49
31	49	---	e96	907	---	708	---	795	---	49	50	---
TOTAL	1,419	2,132	6,386	9,997	8,611	16,497	16,626	23,272	9,015	2,030	1,613	1,545
MEAN	45.8	71.1	206	322	297	532	554	751	300	65.5	52.0	51.5
MAX	56	267	583	1,850	566	778	737	1,600	842	93	81	62
MIN	42	48	92	48	174	235	403	401	96	49	43	47
AC-FT	2,810	4,230	12,670	19,830	17,080	32,720	32,980	46,160	17,880	4,030	3,200	3,060
CFSM	0.35	0.54	1.57	2.46	2.27	4.06	4.23	5.73	2.29	0.50	0.40	0.39
IN.	0.40	0.61	1.81	2.84	2.45	4.68	4.72	6.61	2.56	0.58	0.46	0.44

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1934 - 2004, BY WATER YEAR (WY)

MEAN	57.1	127	233	264	328	398	539	444	184	63.9	47.0	46.7
MAX	169	405	716	656	1,074	989	885	1,135	591	110	63.4	81.6
(WY)	(1952)	(1948)	(1976)	(1965)	(1996)	(1972)	(1974)	(1948)	(1974)	(1948)	(1975)	(1959)
MIN	39.1	40.2	44.4	45.7	71.8	189	162	67.0	49.4	39.5	36.9	34.9
(WY)	(1936)	(1936)	(1966)	(1937)	(1977)	(1955)	(1941)	(1934)	(1992)	(1934)	(1939)	(1935)

## 14020000 UMATILLA RIVER ABOVE MEACHAM CREEK, NEAR GIBBON, OR—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1934 - 2004	
ANNUAL TOTAL	81,777		99,143			
ANNUAL MEAN	224		271		227	
HIGHEST ANNUAL MEAN					415	1974
LOWEST ANNUAL MEAN					114	1977
HIGHEST DAILY MEAN	1,780	Jan 31	1,850	Jan 29	5,130	Dec 12, 1946
LOWEST DAILY MEAN	35	Aug 16	42	Oct 1	28	Jan 9, 1937
ANNUAL SEVEN-DAY MINIMUM	35	Aug 14	42	Oct 1	31	Sep 26, 1935
ANNUAL RUNOFF (AC-FT)	162,200		196,700		164,400	
ANNUAL RUNOFF (CFSM)	1.71		2.07		1.73	
ANNUAL RUNOFF (INCHES)	23.22		28.15		23.54	
10 PERCENT EXCEEDS	549		628		550	
50 PERCENT EXCEEDS	106		176		118	
90 PERCENT EXCEEDS	39		47		44	

e Estimated



2004 Water Year  
UMATILLA RIVER BASIN

1402000 UMATILLA RIVER ABOVE MEACHAM CREEK, NR GIBBON, OR

Latitude: 45° 43 ' 11"

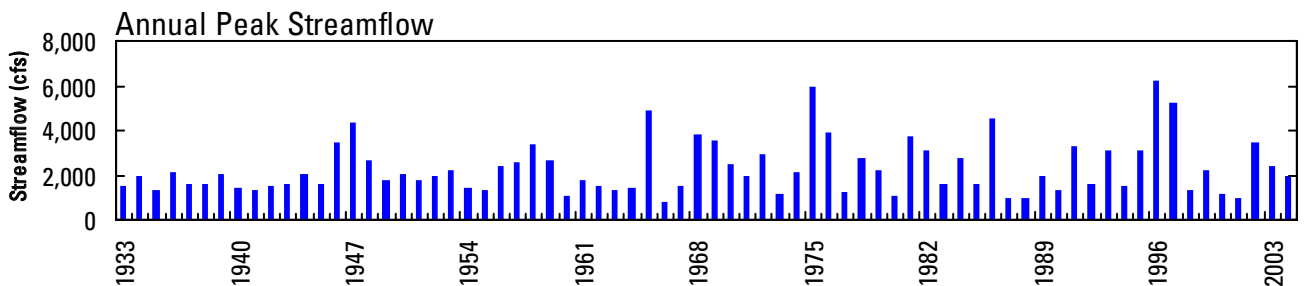
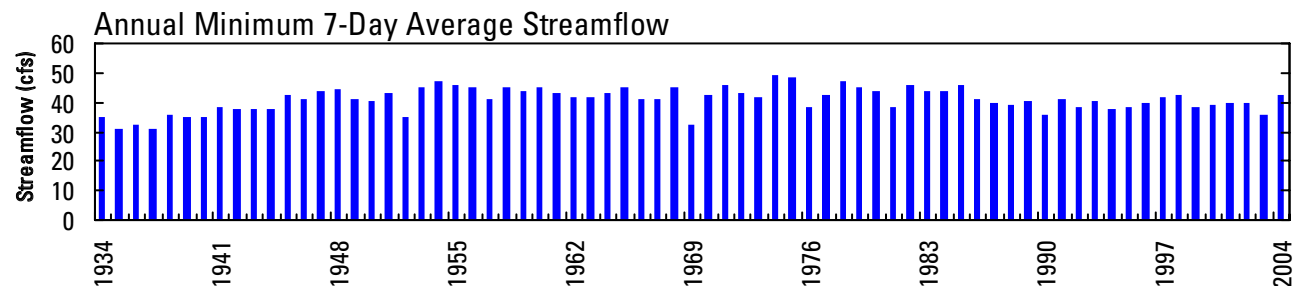
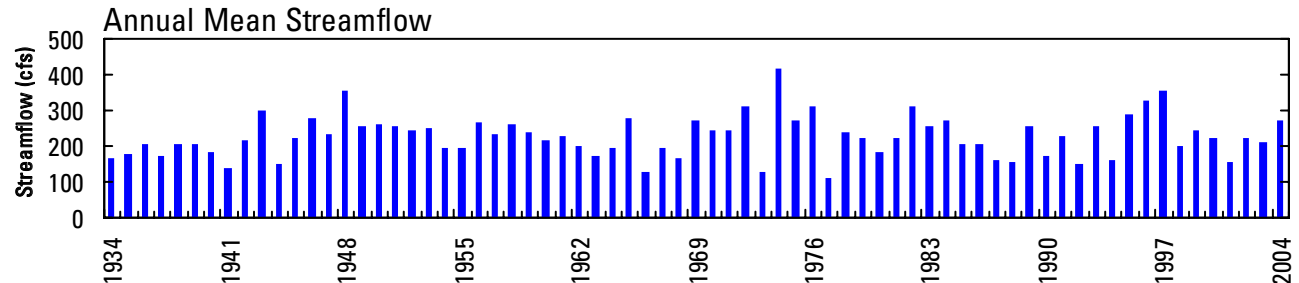
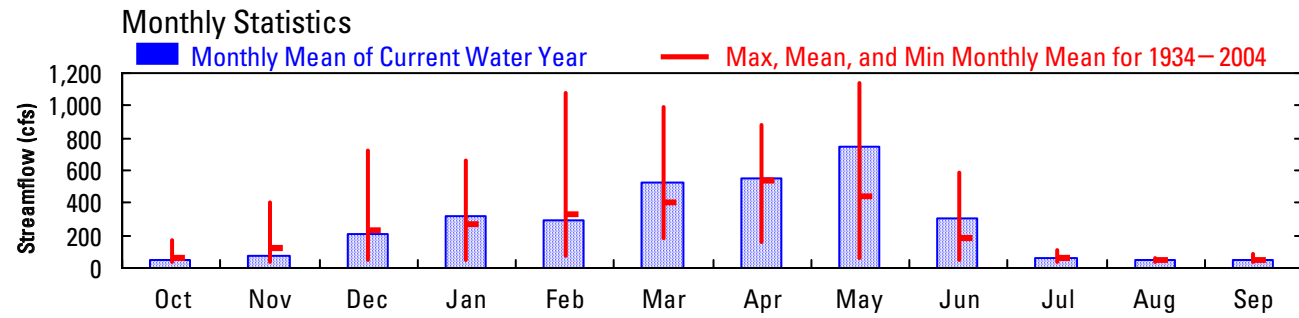
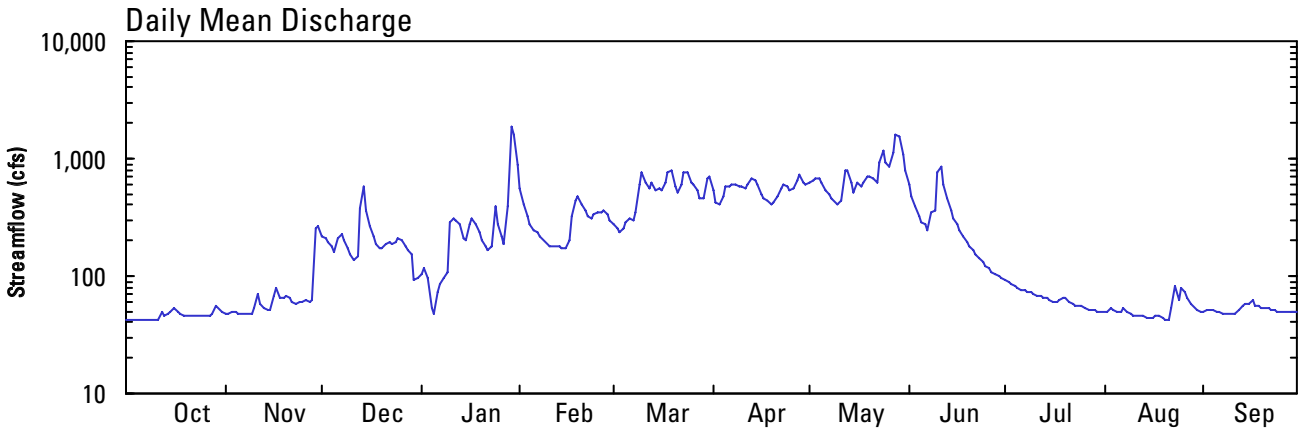
Longitude: 118° 19 ' 20"

Hydrologic Unit Code: 17070103

Umatilla County

Datum: 1,854.81 feet

Drainage Area: 131 square miles



14020300 MEACHAM CREEK AT GIBBON, OR

LOCATION.--Lat 45°41'20", long 118°21'20", in SE ¼ SE ¼ sec.31, T.3 N., R.36 E., Umatilla County, Hydrologic Unit 17070103, on left bank 250 ft downstream from Union Pacific railroad bridge, 0.9 mi southeast of Gibbon, and at mile 1.4.

DRAINAGE AREA.--176 mi<sup>2</sup>.

PERIOD OF RECORD.--August 1975 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,803.05 ft above NGVD of 1929.

REMARKS.--Records good except for estimated daily discharges, which are poor. Possible regulation or diversion upstream from station. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--29 years (water years 1976-2004), 204 ft<sup>3</sup>/s, 15.78 in/yr, 148,100 acre-ft.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,930 ft<sup>3</sup>/s Nov. 28, 1995, gage height, 7.67 ft, from rating curve extended above 4,600 ft<sup>3</sup>/s; maximum gage height, 8.16 ft, from floodmark; minimum discharge, 5.9 ft<sup>3</sup>/s Sept. 3-6, 2003.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Jan. 25, 1975, reached a stage of 7.21 ft, from floodmark, discharge, about 8,200 ft<sup>3</sup>/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,600 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan 29	2115	*2,580	*5.51	May 28	2200	1,730	4.96
May 24	0045	1,870	5.04				

Minimum discharge, 8.0 ft<sup>3</sup>/s, Oct. 3-7.

DISCHARGE, CUBIC FEET PER SECOND  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.7	12	94	e86	787	330	695	340	551	45	14	17
2	8.8	12	130	e96	556	305	523	341	425	42	14	16
3	8.6	13	131	e80	448	284	466	349	347	40	15	16
4	8.6	13	125	e44	378	293	497	334	292	39	14	14
5	8.6	13	116	e40	330	294	589	308	250	37	14	13
6	8.6	13	148	e60	297	322	586	270	224	36	15	13
7	8.6	13	183	e68	282	322	588	240	200	33	16	12
8	8.8	13	165	e82	258	391	554	223	207	32	14	12
9	8.8	13	144	e110	235	828	511	204	207	31	14	e12
10	8.9	14	127	262	217	1,230	468	195	281	30	13	e12
11	9.5	16	119	267	207	1,010	431	215	336	29	13	e12
12	10	15	118	248	197	911	428	472	302	28	12	e13
13	9.8	15	192	230	192	1,070	452	621	267	27	12	e14
14	10	16	497	219	193	930	423	503	229	26	11	e15
15	11	17	409	217	191	1,020	417	412	203	25	11	e16
16	12	20	291	291	213	969	367	427	178	24	11	17
17	11	21	226	395	289	1,120	348	404	157	24	10	18
18	11	19	185	346	355	1,260	333	420	139	24	10	19
19	12	20	162	283	466	1,360	323	488	121	25	9.5	19
20	12	22	155	235	476	993	334	584	106	24	9.2	20
21	12	21	157	199	440	862	375	668	94	22	9.0	19
22	12	21	165	173	402	1,020	436	623	87	22	13	19
23	12	19	168	191	376	1,280	465	981	82	21	15	18
24	12	20	166	460	382	1,280	439	1,670	74	20	15	17
25	12	20	167	378	370	966	397	1,160	67	20	19	16
26	12	20	158	302	365	850	374	887	62	19	20	16
27	12	20	143	256	374	747	392	1,190	57	18	18	15
28	12	20	134	361	369	651	431	1,540	54	17	18	15
29	14	40	126	1,970	351	636	386	1,570	51	16	18	14
30	13	56	e76	1,990	---	873	350	1,120	48	16	18	14
31	12	---	e80	1,230	---	942	---	775	---	15	17	---
TOTAL	330.3	567	5,257	11,169	9,996	25,349	13,378	19,534	5,698	827	431.7	463
MEAN	10.7	18.9	170	360	345	818	446	630	190	26.7	13.9	15.4
MAX	14	56	497	1,990	787	1,360	695	1,670	551	45	20	20
MIN	8.6	12	76	40	191	284	323	195	48	15	9.0	12
AC-FT	655	1,120	10,430	22,150	19,830	50,280	26,540	38,750	11,300	1,640	856	918
CFSM	0.06	0.11	0.96	2.05	1.96	4.65	2.53	3.58	1.08	0.15	0.08	0.09
IN.	0.07	0.12	1.11	2.36	2.11	5.36	2.83	4.13	1.20	0.17	0.09	0.10

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1976 - 2004, BY WATER YEAR (WY)

	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	
MEAN	15.9	75.5	196	248	388	529	548	319	99.5	23.5	12.4	12.0																		
MAX	28.8	323	582	583	1,074	1,016	956	668	354	52.2	20.7	16.7																		
(WY)	(2001)	(1996)	(1976)	(1997)	(1996)	(1997)	(1985)	(1991)	(1984)	(1984)	(1993)	(1978)																		
MIN	8.48	11.2	18.0	22.2	27.1	134	228	58.3	21.7	12.3	7.60	8.44																		
(WY)	(1988)	(1988)	(1977)	(1977)	(1977)	(1977)	(1986)	(1992)	(1992)	(2003)	(2003)	(2003)																		

## UMATILLA RIVER BASIN

14020300 MEACHAM CREEK AT GIBBON, OR—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1976 - 2004	
ANNUAL TOTAL	76,490.4		93,000.0			
ANNUAL MEAN	210		254		204	
HIGHEST ANNUAL MEAN					352	
LOWEST ANNUAL MEAN					66.2	
HIGHEST DAILY MEAN	2,270	Jan 31	1,990	Jan 30	4,820	Feb 8, 1996
LOWEST DAILY MEAN	6.4	Sep 4	8.6	Oct 3	6.4	Sep 4, 2003
ANNUAL SEVEN-DAY MINIMUM	6.5	Aug 31	8.6	Oct 1	6.5	Aug 31, 2003
ANNUAL RUNOFF (AC-FT)	151,700		184,500		148,100	
ANNUAL RUNOFF (CFSM)	1.19		1.44		1.16	
ANNUAL RUNOFF (INCHES)	16.17		19.66		15.78	
10 PERCENT EXCEEDS	603		656		556	
50 PERCENT EXCEEDS	74		128		71	
90 PERCENT EXCEEDS	8.4		12		11	

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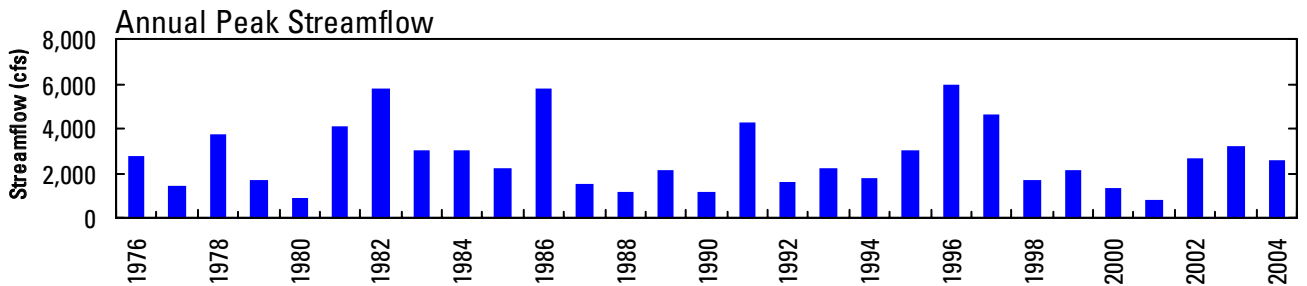
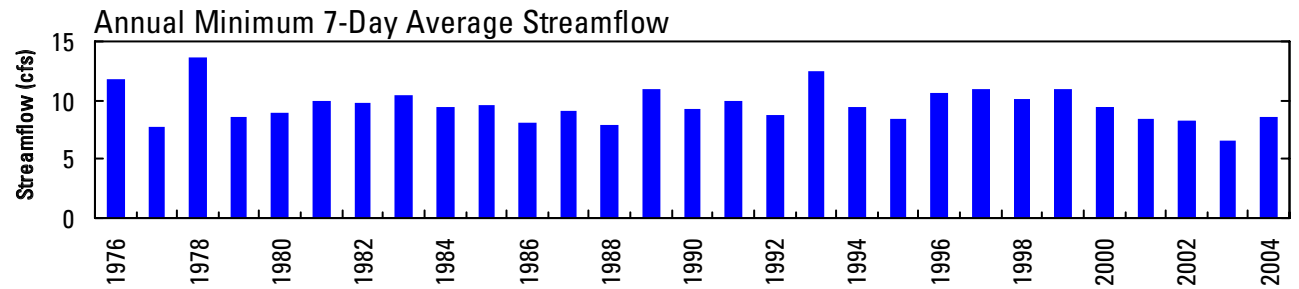
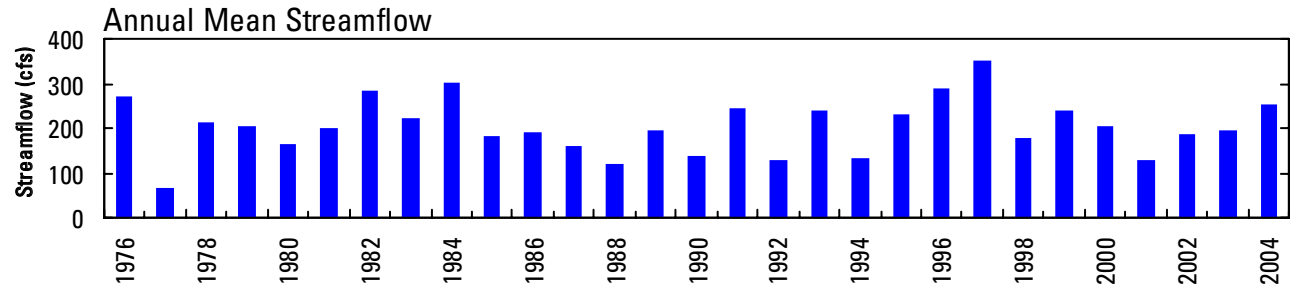
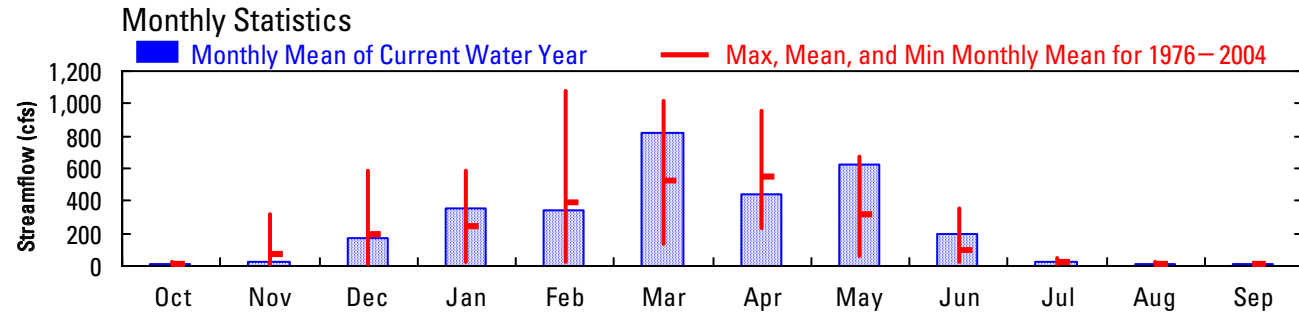
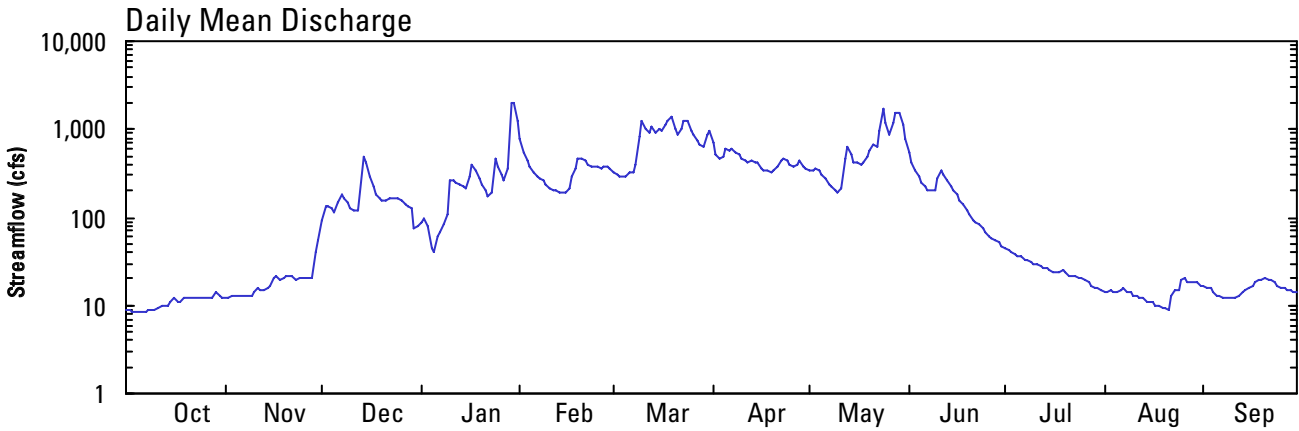
2004 Water Year  
UMATILLA RIVER BASIN

14020300 MEACHAM CREEK AT GIBBON, OR

Latitude: 45° 41 ' 20"  
Umatilla County

Longitude: 118° 21 ' 20"  
Datum: 1,803.05 feet

Hydrologic Unit Code: 17070103  
Drainage Area: 176 square miles





## 14020520 SQUAW CREEK NEAR GIBBON, OR

LOCATION.--Lat 45°40'22", long 118°24'00", in NW ¼ NE ¼ sec.11, T.2 N., R.35 E., Umatilla County, Hydrologic Unit 17070103, on right bank, 2 mi southwest of townsite of Gibbon, and at mile 2.2.

DRAINAGE AREA.--32.6 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1998 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,850 ft above NGVD of 1929, from topographic map.

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

AVERAGE DISCHARGE.--6 years (water years 1999-2004), 30.1 ft<sup>3</sup>/s, 12.53 in/yr, 21,780 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,600 ft<sup>3</sup>/s Jan. 29, 2004, gage height, 3.89 ft, from rating curve extended above 750 ft<sup>3</sup>/s; minimum discharge, 0.48 ft<sup>3</sup>/s Aug. 21, 30, 31, Sept. 1, 3-6 2003.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 370 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan 29	0745	*1,600	*3.89	No other peak above base discharge.			

Minimum discharge, 0.64 ft<sup>3</sup>/s, Aug. 19-21.

DISCHARGE, CUBIC FEET PER SECOND  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.85	2.9	30	19	107	49	35	28	70	3.8	1.1	1.2
2	0.88	2.8	27	18	82	45	29	25	51	3.5	1.1	1.2
3	0.89	2.9	23	18	66	43	26	21	38	3.3	1.2	1.2
4	0.90	2.9	20	e14	57	45	24	19	30	3.2	1.2	1.2
5	0.90	2.8	18	e11	51	53	24	16	25	3.0	1.1	1.1
6	0.89	2.7	27	e12	48	81	23	14	23	2.9	1.2	1.1
7	0.98	2.7	31	e13	47	84	21	13	20	2.7	1.4	1.0
8	1.0	2.8	28	14	44	106	19	11	22	2.6	1.2	0.98
9	1.2	2.9	26	65	41	138	17	10	23	2.4	1.1	0.97
10	1.2	3.2	23	101	38	134	15	11	52	2.3	1.0	0.89
11	1.3	4.3	20	78	36	107	14	16	63	2.2	0.99	0.96
12	1.5	3.6	21	61	34	97	13	48	54	2.1	0.94	1.2
13	1.4	3.4	104	50	32	98	12	51	45	2.0	0.90	1.5
14	1.6	3.3	140	45	29	87	12	43	37	1.9	0.90	1.7
15	1.8	3.3	82	41	28	89	17	36	30	1.8	0.94	1.5
16	1.9	4.7	57	62	38	84	16	37	25	1.7	0.88	1.7
17	1.8	4.9	41	65	98	86	17	33	21	1.7	0.89	1.8
18	1.6	4.2	34	52	122	87	18	54	18	1.8	0.93	1.7
19	1.6	5.2	29	43	111	84	18	84	15	2.0	0.83	1.5
20	1.6	5.4	26	35	92	65	24	93	13	2.1	0.78	1.5
21	1.6	4.7	26	30	79	56	36	98	11	1.8	0.76	1.4
22	1.6	4.5	26	26	67	55	70	87	9.6	1.6	1.2	1.3
23	1.8	4.2	25	32	59	59	78	130	8.5	1.5	1.4	1.3
24	1.9	4.7	27	182	59	56	62	179	7.6	1.5	1.5	1.3
25	1.9	4.7	30	134	58	49	50	128	6.6	1.4	2.0	1.2
26	1.9	4.9	30	94	58	45	41	109	5.9	1.4	1.7	1.1
27	1.9	4.9	27	73	57	43	34	131	5.4	1.3	1.4	1.1
28	2.3	4.9	25	160	55	40	35	230	5.0	1.3	1.2	1.1
29	3.2	26	23	933	52	39	34	207	4.7	1.3	1.3	1.0
30	2.9	33	20	277	---	43	31	135	4.2	1.3	1.3	1.0
31	2.9	---	19	149	---	42	---	98	---	1.2	1.2	---
TOTAL	49.69	167.4	1,085	2,907	1,745	2,189	865	2,195	743.5	64.6	35.54	37.70
MEAN	1.60	5.58	35.0	93.8	60.2	70.6	28.8	70.8	24.8	2.08	1.15	1.26
MAX	3.2	33	140	933	122	138	78	230	70	3.8	2.0	1.8
MIN	0.85	2.7	18	11	28	39	12	10	4.2	1.2	0.76	0.89
AC-FT	99	332	2,150	5,770	3,460	4,340	1,720	4,350	1,470	128	70	75
CFSM	0.05	0.17	1.07	2.88	1.85	2.17	0.88	2.17	0.76	0.06	0.04	0.04
IN.	0.06	0.19	1.24	3.32	1.99	2.50	0.99	2.50	0.85	0.07	0.04	0.04

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1999 - 2004, BY WATER YEAR (WY)

MEAN	2.77	12.8	41.3	56.6	66.9	95.4	50.4	24.6	8.06	1.42	0.96	1.16
MAX	7.55	20.5	88.9	93.8	98.5	144	85.1	70.8	24.8	2.08	1.15	1.91
(WY)	(2001)	(1999)	(1999)	(2004)	(2003)	(2000)	(2002)	(2004)	(2004)	(2004)	(2004)	(2000)
MIN	1.14	2.16	3.80	17.2	24.9	57.3	28.8	8.14	2.62	1.04	0.71	0.83
(WY)	(2000)	(2003)	(2003)	(2001)	(2001)	(2001)	(2004)	(2002)	(2001)	(2002)	(2003)	(2003)

14020520 SQUAW CREEK NEAR GIBBON, OR—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1999 - 2004	
ANNUAL TOTAL	12,688.69		12,084.43			
ANNUAL MEAN	34.8		33.0		30.1	
HIGHEST ANNUAL MEAN					35.5	2000
LOWEST ANNUAL MEAN					19.0	2001
HIGHEST DAILY MEAN	385	Jan 30	933	Jan 29	933	Jan 29, 2004
LOWEST DAILY MEAN	0.58	Aug 21	0.76	Aug 21	0.58	Aug 21, 2003
ANNUAL SEVEN-DAY MINIMUM	0.60	Aug 31	0.86	Aug 15	0.60	Aug 31, 2003
ANNUAL RUNOFF (AC-FT)	25,170		23,970		21,780	
ANNUAL RUNOFF (CFSM)	1.07		1.01		0.922	
ANNUAL RUNOFF (INCHES)	14.48		13.79		12.53	
10 PERCENT EXCEEDS	106		86		84	
50 PERCENT EXCEEDS	9.3		17		9.5	
90 PERCENT EXCEEDS	0.78		1.2		0.96	

e Estimated



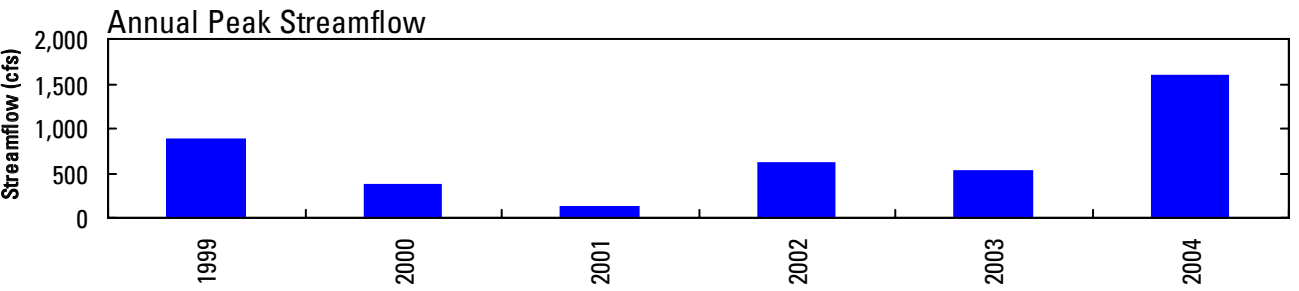
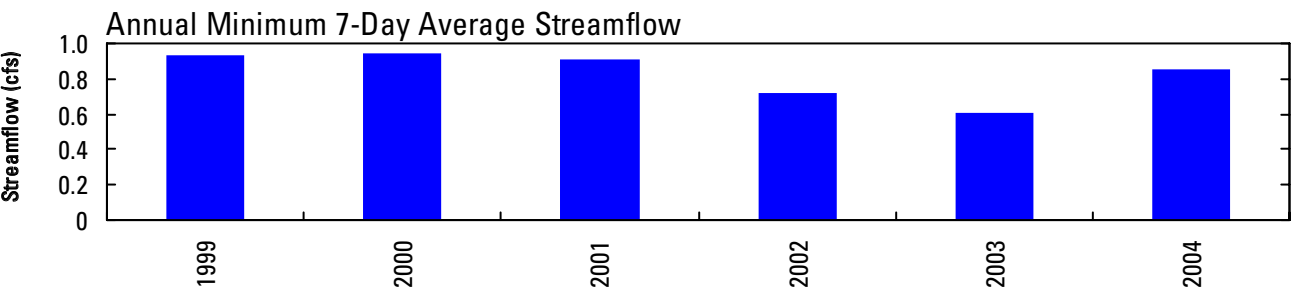
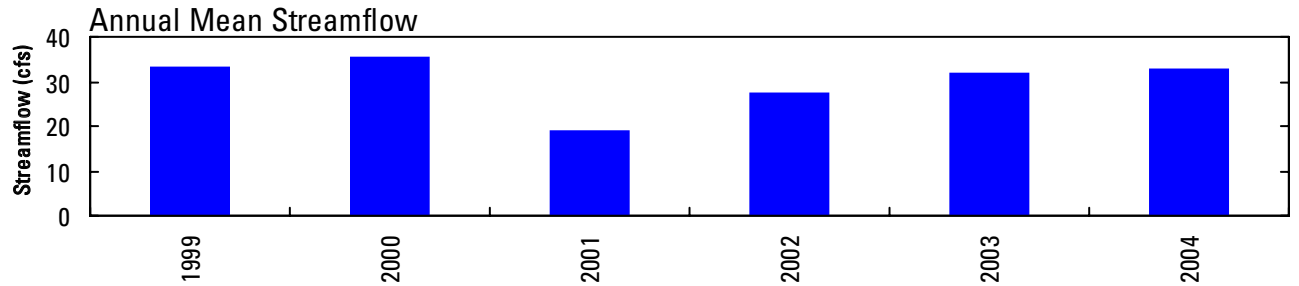
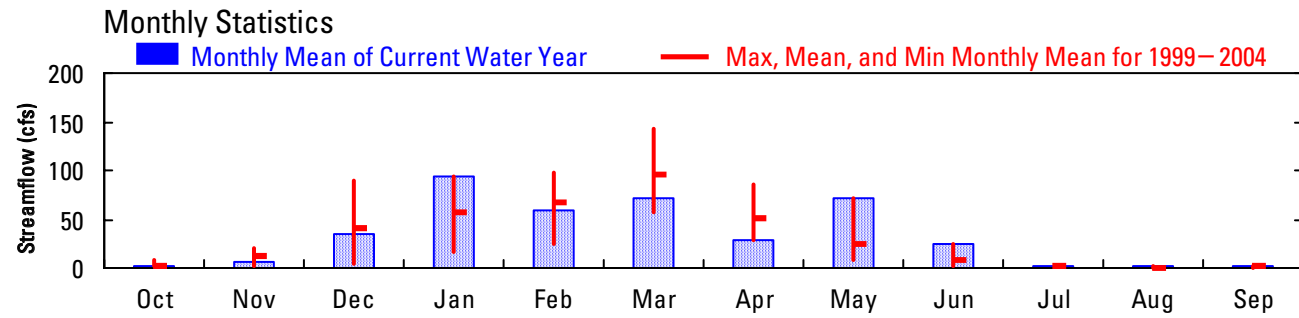
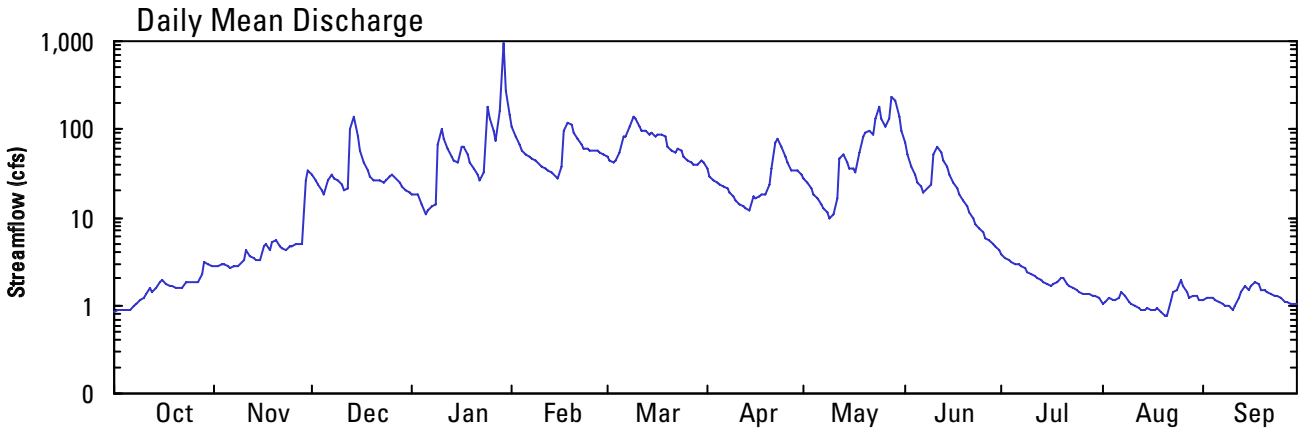
2004 Water Year  
UMATILLA RIVER BASIN

14020520 SQUAW CREEK NEAR GIBBON, OR

Latitude: 45° 40' 22"  
Umatilla County

Longitude: 118° 24' 00"  
Datum: 1,850 feet

Hydrologic Unit Code: 17070103  
Drainage Area: 32.6 square miles



14020740 MOONSHINE CREEK NEAR MISSION, OR

LOCATION.--Lat 45°39'37", long 118°33'55", in NW ¼ NE ¼ sec.16, T.2 N., R.34 E., Umatilla County, Hydrologic Unit 17070103, Umatilla Indian Reservation, on left bank, 60 ft upstream from county road crossing, 5.7 mi east of Mission, and at mile 1.1.

DRAINAGE AREA.--4.62 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1991 to December 2003 (discontinued).

REVISED RECORDS.--WDR OR-93-1: 1992(M); WDR OR-94-1: 1993.

GAGE.--Water-stage recorder. Elevation of gage is 1,600 ft above NGVD of 1929, from topographic map.

REMARKS.--No estimated daily discharges. Records poor. No known regulation.

AVERAGE DISCHARGE.--12 years (water years 1992-2003), 3.05 ft<sup>3</sup>/s, 2,210 acre-ft per year.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 247 ft<sup>3</sup>/s Feb. 7, 1996, gage height, 6.67 ft, from rating curve extended above 75 ft<sup>3</sup>/s; no flow part of or all of each day Oct. 1-14, 1992, Sept. 6-10, 1993, Oct. 2, 15-19, 1993.

DISCHARGE, CUBIC FEET PER SECOND  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.14	0.36	0.50	---	---	---	---	---	---	---	---	---
2	0.14	0.36	0.50	---	---	---	---	---	---	---	---	---
3	0.14	0.36	0.50	---	---	---	---	---	---	---	---	---
4	0.14	0.32	0.50	---	---	---	---	---	---	---	---	---
5	0.15	0.32	0.50	---	---	---	---	---	---	---	---	---
6	0.15	0.32	0.55	---	---	---	---	---	---	---	---	---
7	0.17	0.32	0.55	---	---	---	---	---	---	---	---	---
8	0.17	0.32	0.52	---	---	---	---	---	---	---	---	---
9	0.16	0.32	0.53	---	---	---	---	---	---	---	---	---
10	0.17	0.33	0.78	---	---	---	---	---	---	---	---	---
11	0.17	0.32	1.1	---	---	---	---	---	---	---	---	---
12	0.19	0.32	2.3	---	---	---	---	---	---	---	---	---
13	0.19	0.32	8.7	---	---	---	---	---	---	---	---	---
14	0.21	0.32	13	---	---	---	---	---	---	---	---	---
15	0.22	0.33	6.5	---	---	---	---	---	---	---	---	---
16	0.22	0.40	4.7	---	---	---	---	---	---	---	---	---
17	0.22	0.45	3.5	---	---	---	---	---	---	---	---	---
18	0.22	0.45	2.9	---	---	---	---	---	---	---	---	---
19	0.22	0.48	2.4	---	---	---	---	---	---	---	---	---
20	0.22	0.45	2.1	---	---	---	---	---	---	---	---	---
21	0.22	0.45	1.9	---	---	---	---	---	---	---	---	---
22	0.25	0.45	1.9	---	---	---	---	---	---	---	---	---
23	0.27	0.45	1.8	---	---	---	---	---	---	---	---	---
24	0.30	0.49	2.7	---	---	---	---	---	---	---	---	---
25	0.33	0.50	4.7	---	---	---	---	---	---	---	---	---
26	0.32	0.48	4.7	---	---	---	---	---	---	---	---	---
27	0.32	0.45	3.7	---	---	---	---	---	---	---	---	---
28	0.33	0.45	3.2	---	---	---	---	---	---	---	---	---
29	0.36	0.55	2.9	---	---	---	---	---	---	---	---	---
30	0.36	0.50	2.5	---	---	---	---	---	---	---	---	---
31	0.36	---	2.3	---	---	---	---	---	---	---	---	---
TOTAL	7.03	11.94	84.93	---	---	---	---	---	---	---	---	---
MEAN	0.23	0.40	2.74	---	---	---	---	---	---	---	---	---
MAX	0.36	0.55	13	---	---	---	---	---	---	---	---	---
MIN	0.14	0.32	0.50	---	---	---	---	---	---	---	---	---
AC-FT	14	24	168	---	---	---	---	---	---	---	---	---

CAL YR2003 TOTAL 1,078.96 MEAN 2.96 MAX 44 MIN 0.12 AC-FT 2140

## 14020850 UMATILLA RIVER AT WEST RESERVATION BOUNDARY, NEAR PENDLETON, OR

LOCATION.--Lat 45°40'18", long 118°44'08", in NE ¼ NW ¼ sec.7, T.2 N., R.33 E., Umatilla County, Hydrologic Unit 17070103, on left bank, 0.5 mi east of west line of boundary for Umatilla Indian Reservation, 1.6 mi upstream from Wildhorse Creek, 2.5 mi east of Post Office in Pendleton, and at mile 58.3.

DRAINAGE AREA.--440.8 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1995 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,130 ft above NGVD of 1929, from topographic map.

REMARKS.--Records fair. No known regulation. Many diversions for irrigation upstream from station. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--9 years (water years 1996-2004), 559 ft<sup>3</sup>/s, 404,900 acre-ft.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 12,700 ft<sup>3</sup>/s Feb. 9, 1996, gage height, 11.64 ft; minimum discharge, 25 ft<sup>3</sup>/s Aug. 19, 2003.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan 29	1400	*6,880	*8.94	May 29	0415	4,350	7.38
May 24	0515	3,560	6.90				

Minimum discharge, 39 ft<sup>3</sup>/s, Aug. 20-22.

DISCHARGE, CUBIC FEET PER SECOND  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	43	62	384	321	1,890	793	1,410	1,030	1,520	e170	49	54
2	43	62	438	313	1,360	751	1,140	1,040	1,160	e150	48	56
3	43	64	423	299	1,100	717	1,030	1,070	903	e140	51	57
4	43	64	403	293	944	720	1,050	1,050	768	e130	54	56
5	42	64	357	223	865	764	1,210	1,000	684	e120	53	54
6	42	64	398	246	808	819	1,230	928	646	e110	52	52
7	42	63	517	294	790	827	1,260	855	594	98	58	51
8	43	62	484	351	752	887	1,240	818	674	95	55	50
9	43	64	438	553	708	1,410	1,170	781	705	92	50	49
10	44	66	392	876	677	2,140	1,120	749	1,170	88	46	51
11	45	83	356	877	655	1,950	1,090	776	1,530	84	44	51
12	52	88	339	767	641	1,620	1,090	1,130	1,180	80	43	58
13	51	79	564	676	630	1,880	1,160	1,430	915	76	42	59
14	48	75	1,480	633	624	1,690	1,140	1,210	769	73	41	66
15	56	74	1,140	606	619	1,720	1,130	1,040	681	70	43	63
16	62	83	850	748	636	1,650	1,020	1,080	615	68	41	68
17	57	110	672	932	999	1,840	954	1,060	559	68	42	68
18	52	108	551	883	1,280	2,130	920	1,090	511	71	44	69
19	51	104	479	758	1,390	2,400	893	1,280	472	77	42	66
20	50	115	450	658	1,320	1,840	908	1,390	434	81	40	66
21	48	109	450	565	1,160	1,530	986	1,460	399	72	39	65
22	48	103	467	495	1,000	1,680	1,160	1,410	366	66	46	63
23	49	100	470	510	932	2,130	1,250	1,770	337	63	71	60
24	51	102	478	1,450	934	2,230	1,190	3,240	312	61	75	59
25	52	103	511	1,270	939	1,730	1,100	2,330	288	58	77	58
26	52	103	510	931	916	1,550	1,060	1,800	266	56	92	58
27	53	103	470	789	925	1,420	1,110	2,230	250	56	76	58
28	51	101	440	885	912	1,290	1,240	3,410	e238	55	67	57
29	58	208	412	5,250	840	1,210	1,130	3,980	e210	53	62	55
30	64	450	364	5,320	---	1,450	1,050	2,840	e190	52	58	55
31	62	---	334	3,200	---	1,770	---	1,960	---	50	55	---
TOTAL	1,540	3,036	16,021	31,972	27,246	46,538	33,441	47,237	19,346	2,583	1,656	1,752
MEAN	49.7	101	517	1,031	940	1,501	1,115	1,524	645	83.3	53.4	58.4
MAX	64	450	1,480	5,320	1,890	2,400	1,410	3,980	1,530	170	92	69
MIN	42	62	334	223	619	717	893	749	190	50	39	49
AC-FT	3,050	6,020	31,780	63,420	54,040	92,310	66,330	93,690	38,370	5,120	3,280	3,480

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1996 - 2004, BY WATER YEAR (WY)

	63.0	255	608	805	1,062	1,344	1,304	863	278	66.9	43.1	47.3
MEAN	63.0	255	608	805	1,062	1,344	1,304	863	278	66.9	43.1	47.3
MAX	101	717	1,186	1,360	2,801	1,971	1,898	1,524	645	83.3	53.4	58.4
(WY)	(2001)	(1996)	(1997)	(1997)	(1996)	(1997)	(2002)	(2004)	(2004)	(2004)	(2004)	(2004)
MIN	47.2	61.0	83.5	246	339	871	693	517	117	38.6	30.3	40.2
(WY)	(2003)	(2003)	(2003)	(2001)	(2001)	(2001)	(1998)	(2000)	(2001)	(2003)	(2003)	(2001)

## 14020850 UMATILLA RIVER AT WEST RESERVATION BOUNDARY, NEAR PENDLETON, OR—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1996 - 2004	
ANNUAL TOTAL	197,442		232,368			
ANNUAL MEAN	541		635		559	
HIGHEST ANNUAL MEAN					777	1997
LOWEST ANNUAL MEAN					343	2001
HIGHEST DAILY MEAN	5,300	Jan 31	5,320	Jan 30	11,700	Feb 9, 1996
LOWEST DAILY MEAN	27	Aug 16	39	Aug 21	27	Aug 16, 2003
ANNUAL SEVEN-DAY MINIMUM	27	Aug 16	42	Aug 15	27	Aug 16, 2003
ANNUAL RUNOFF (AC-FT)	391,600		460,900		404,900	
10 PERCENT EXCEEDS	1,430		1,450		1,370	
50 PERCENT EXCEEDS	238		438		270	
90 PERCENT EXCEEDS	33		51		44	

e Estimated



2004 Water Year  
UMATILLA RIVER BASIN

14020850 UMATILLA R AT W RESERVATION BOUNDARY, NR PENDLETON, OR

Latitude: 45° 40' 18"

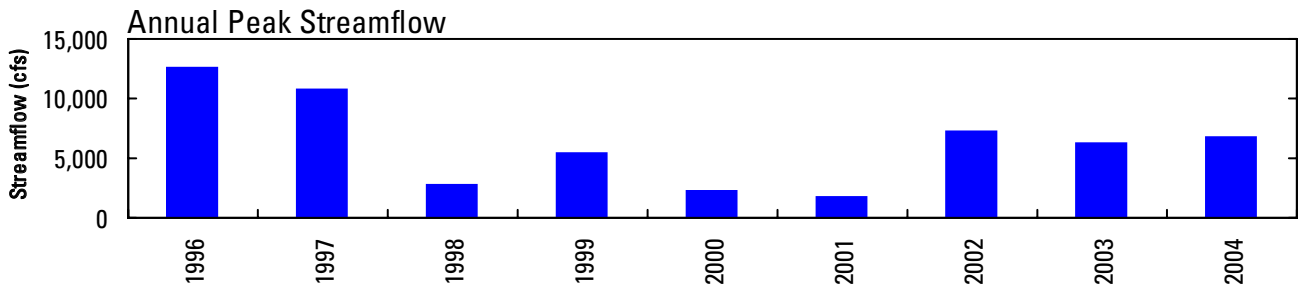
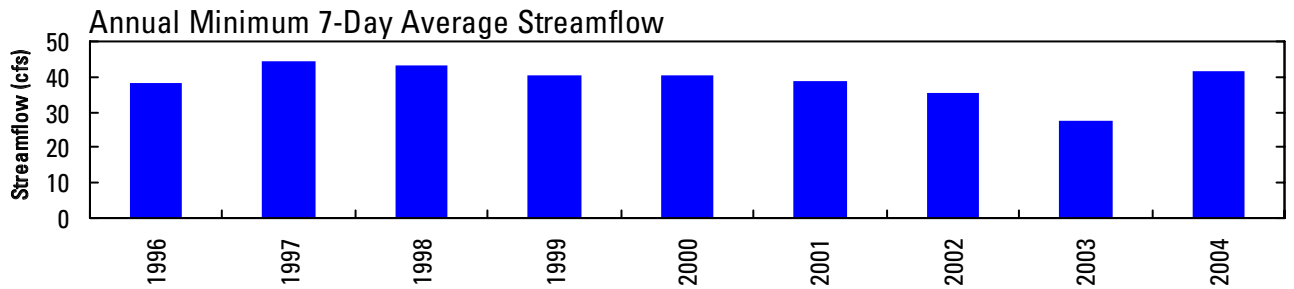
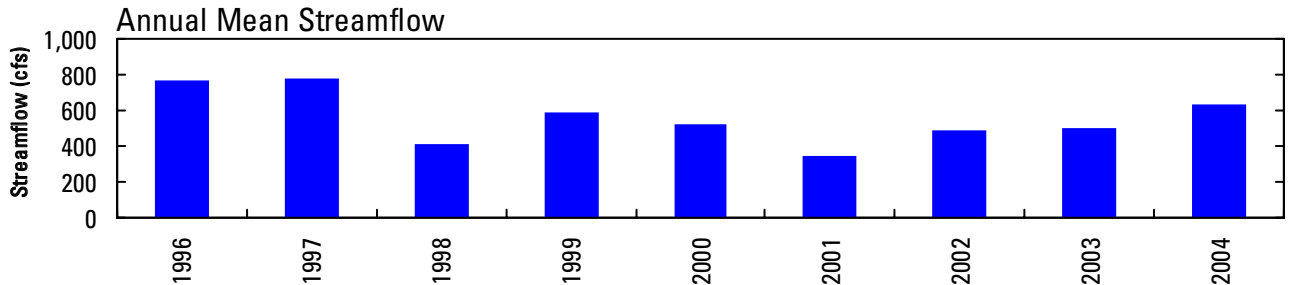
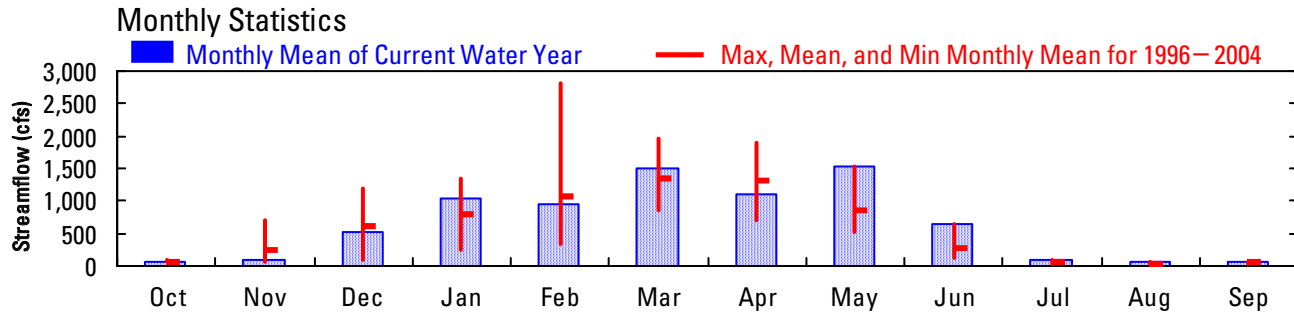
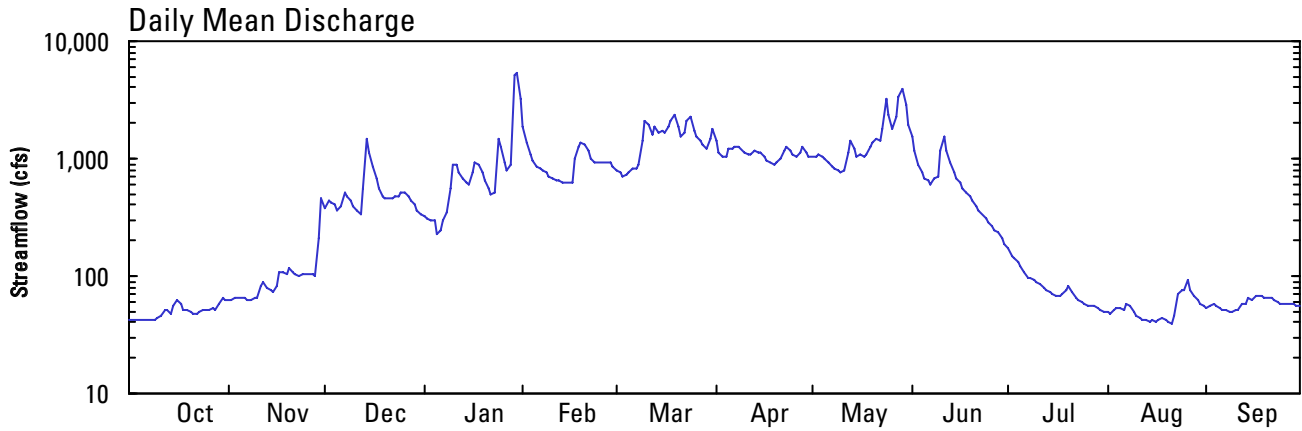
Longitude: 118° 44' 08"

Hydrologic Unit Code: 17070103

Umatilla County

Datum: 1,130 feet

Drainage Area: 441 square miles



14021980 PATAWA CREEK AT WEST RESERVATION BOUNDARY, NEAR PENDLETON, OR

LOCATION.--Lat 45°39'11", long 118°44'39", in NW ¼ SW ¼ sec. 18, T.2 N., R.33 E., Umatilla County, Hydrologic Unit 17070103, Umatilla Indian Reservation, on right bank, at downstream side of county road crossing, 2 mi southwest of Pendleton City Hall, and at mile 2.9.

DRAINAGE AREA.--30 mi<sup>2</sup>, excludes about 1 mi<sup>2</sup> in upper basin where water has been diverted directly to the Umatilla River.

PERIOD OF RECORD.--December 1973 to April 1975 (discharge measurements only), October 1991 to December 2003 (discontinued).

REVISED RECORDS.--WDR OR-94-1: 1993 (M).

GAGE.--Water-stage recorder. Elevation of gage is 1,220 ft above NGVD of 1929, from topographic map.

REMARKS.--No estimated daily discharges. Records poor. No known regulation.

AVERAGE DISCHARGE.--12 years (water years 1992-2003), 5.16 ft<sup>3</sup>/s, 3,740 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge 378 ft<sup>3</sup>/s Feb. 7, 1996, gage height, 7.94 ft; minimum discharge, 0.01 ft<sup>3</sup>/s July 22, 23, 27, 28, July 30 to Aug. 1, 1999.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1.4 ft<sup>3</sup>/s Nov. 9, gage height, 3.76 ft; minimum discharge, 0.04 ft<sup>3</sup>/s Dec. 31.

DISCHARGE, CUBIC FEET PER SECOND  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.12	0.93	0.25	---	---	---	---	---	---	---	---	---
2	0.10	1.0	0.18	---	---	---	---	---	---	---	---	---
3	0.10	1.0	0.13	---	---	---	---	---	---	---	---	---
4	0.11	0.78	0.14	---	---	---	---	---	---	---	---	---
5	0.11	0.70	0.13	---	---	---	---	---	---	---	---	---
6	0.12	0.64	0.13	---	---	---	---	---	---	---	---	---
7	0.09	0.59	0.12	---	---	---	---	---	---	---	---	---
8	0.08	0.57	0.12	---	---	---	---	---	---	---	---	---
9	0.08	0.80	0.09	---	---	---	---	---	---	---	---	---
10	0.09	0.69	0.10	---	---	---	---	---	---	---	---	---
11	0.13	0.44	0.06	---	---	---	---	---	---	---	---	---
12	0.13	0.47	0.09	---	---	---	---	---	---	---	---	---
13	0.14	0.42	0.11	---	---	---	---	---	---	---	---	---
14	0.17	0.44	0.14	---	---	---	---	---	---	---	---	---
15	0.23	0.47	0.10	---	---	---	---	---	---	---	---	---
16	0.26	0.49	0.09	---	---	---	---	---	---	---	---	---
17	0.26	0.50	0.10	---	---	---	---	---	---	---	---	---
18	0.25	0.44	0.09	---	---	---	---	---	---	---	---	---
19	0.27	0.45	0.12	---	---	---	---	---	---	---	---	---
20	0.28	0.40	0.13	---	---	---	---	---	---	---	---	---
21	0.25	0.35	0.12	---	---	---	---	---	---	---	---	---
22	0.27	0.36	0.13	---	---	---	---	---	---	---	---	---
23	0.22	0.38	0.14	---	---	---	---	---	---	---	---	---
24	0.17	0.73	0.19	---	---	---	---	---	---	---	---	---
25	0.24	0.34	0.21	---	---	---	---	---	---	---	---	---
26	0.41	0.09	0.16	---	---	---	---	---	---	---	---	---
27	0.35	0.09	0.06	---	---	---	---	---	---	---	---	---
28	0.45	0.07	0.05	---	---	---	---	---	---	---	---	---
29	0.82	0.10	0.05	---	---	---	---	---	---	---	---	---
30	0.86	0.16	0.05	---	---	---	---	---	---	---	---	---
31	0.89	---	0.06	---	---	---	---	---	---	---	---	---
TOTAL	8.05	14.89	3.64	---	---	---	---	---	---	---	---	---
MEAN	0.26	0.50	0.12	---	---	---	---	---	---	---	---	---
MAX	0.89	1.0	0.25	---	---	---	---	---	---	---	---	---
MIN	0.08	0.07	0.05	---	---	---	---	---	---	---	---	---
AC-FT	16	30	7.2	---	---	---	---	---	---	---	---	---
CFSM	0.01	0.02	0.00	---	---	---	---	---	---	---	---	---
IN.	0.01	0.02	0.00	---	---	---	---	---	---	---	---	---

CAL YR2003 TOTAL 1,432.00 MEAN 3.92 MAX 142 MIN 0.05 AC-FT 2840 CFSM 0.13 IN. 1.78



## 14021990 TUTUILLA CREEK AT PENDLETON, OR

LOCATION.--Lat 45°39'33", long 118°47'53", in NE ¼ NW ¼ sec.15, T.2 N., R.32 E., Umatilla County, Hydrologic Unit 17070103, on left bank, 265 ft upstream from Tutuilla Creek Road bridge, and at mile 0.95.

DRAINAGE AREA.--60.27 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--January to September 2004.

GAGE.--Water-stage recorder and crest-stage gage. Elevation of gage is 1,090 ft above NGVD of 1929, from topographic map.

REMARKS.--Records good except for estimated daily discharges, which are fair. No known regulation.

EXTREMES FOR CURRENT YEAR.--Maximum recorded discharge, 225 ft<sup>3</sup>/s June 10, gage height, 8.44 ft, but may have been higher during period of estimated record; minimum discharge, 0.14 ft<sup>3</sup>/s Sept. 11.

DISCHARGE, CUBIC FEET PER SECOND  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	e2.0	e20	e7.0	1.8	3.0	19	1.2	0.40	0.36
2	---	---	---	e2.2	e16	e6.8	1.7	2.6	13	1.1	0.56	0.37
3	---	---	---	e2.4	e12	e6.2	1.7	2.3	10	1.1	0.57	0.35
4	---	---	---	e2.0	e10	e6.6	1.7	2.1	7.8	1.0	0.56	0.35
5	---	---	---	e2.6	e9.0	e7.0	1.6	2.0	6.4	1.1	0.56	0.32
6	---	---	---	e2.0	e8.0	e12	1.5	1.9	6.2	0.96	0.61	0.35
7	---	---	---	e1.8	e8.0	e14	1.4	1.8	6.1	0.95	0.58	0.37
8	---	---	---	e2.0	e6.6	e18	1.4	1.7	9.1	0.94	0.54	0.33
9	---	---	---	e10	e5.4	e22	1.4	1.6	11	0.94	0.40	0.22
10	---	---	---	e22	e4.6	e20	1.4	1.6	89	0.91	0.36	0.24
11	---	---	---	e14	e4.0	e12	1.4	1.7	64	0.81	0.42	0.26
12	---	---	---	e12	e3.8	e9.0	1.5	2.2	39	0.75	0.45	0.26
13	---	---	---	e10	e3.4	e8.4	1.5	2.5	26	0.71	0.35	0.39
14	---	---	---	e8.6	e3.2	e6.6	1.5	1.9	18	0.67	0.34	0.36
15	---	---	---	e7.4	e3.0	e6.2	2.0	1.7	13	0.63	0.32	0.34
16	---	---	---	e10	e5.0	5.2	1.8	1.8	9.5	0.64	0.32	0.36
17	---	---	---	e12	e10	4.7	1.7	1.8	7.2	0.66	0.23	0.36
18	---	---	---	e9.4	e20	4.4	1.7	3.4	5.5	0.66	0.25	0.40
19	---	---	---	e7.0	e18	3.7	1.9	6.7	4.3	0.76	0.30	0.35
20	---	---	---	e5.6	e14	3.5	1.9	6.0	3.6	0.65	0.25	0.36
21	---	---	---	e4.4	e12	3.2	4.0	7.8	2.9	0.62	0.23	0.34
22	---	---	---	e3.4	e10	3.1	11	7.9	2.4	0.61	0.89	0.34
23	---	---	---	e5.0	e8.0	2.8	11	21	2.1	0.60	0.48	0.33
24	---	---	---	e30	e8.0	2.7	9.0	48	1.9	0.61	0.53	0.32
25	---	---	---	e18	e8.0	2.5	7.3	29	1.6	0.64	0.95	0.33
26	---	---	---	e10	e7.6	2.4	5.9	24	1.6	0.63	0.48	0.32
27	---	---	---	e7.0	e7.6	2.2	4.9	29	1.5	0.63	0.46	0.23
28	---	---	---	e12	e7.4	2.1	4.3	60	1.4	0.46	0.44	0.21
29	---	---	---	e220	e7.4	2.1	4.2	58	1.3	0.43	0.41	0.24
30	---	---	---	e60	---	2.0	3.5	40	1.3	0.41	0.39	0.24
31	---	---	---	e30	---	1.9	---	27	---	0.40	0.38	---
TOTAL	---	---	---	544.8	260.0	210.3	97.6	402.0	385.7	23.18	14.01	9.60
MEAN	---	---	---	17.6	8.97	6.78	3.25	13.0	12.9	0.75	0.45	0.32
MAX	---	---	---	220	20	22	11	60	89	1.2	0.95	0.40
MIN	---	---	---	1.8	3.0	1.9	1.4	1.6	1.3	0.40	0.23	0.21
AC-FT	---	---	---	1,080	516	417	194	797	765	46	28	19

e Estimated

14022200 NORTH FORK MCKAY CREEK NEAR PILOT ROCK, OR

LOCATION.--Lat 45°30'24", long 118°36'57", in NE ¼ SE ¼ sec.1, T.1 S., R.33 E., Umatilla County, Hydrologic Unit 17070103, Umatilla Indian Reservation, on left bank 10 mi northeast of Pilot Rock and at mile 0.5.

DRAINAGE AREA.--48.6 mi<sup>2</sup>.

PERIOD OF RECORD.--May 1973 to December 2003 (discontinued).

GAGE.--Water-stage recorder. Elevation of gage is 1,870 ft above NGVD of 1929, from topographic map.

REMARKS.--No estimated daily discharges. Records good. No regulation. Minor diversion upstream from station.

AVERAGE DISCHARGE.--30 years (water years 1974-2003), 42.8 ft<sup>3</sup>/s, 31,010 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,980 ft<sup>3</sup>/s Jan. 25, 1975, gage height, 8.48 ft, from floodmark, from rating curve extended above 150 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow; minimum discharge, 0.22 ft<sup>3</sup>/s June 26, 1985 (result of temporary construction upstream).

DISCHARGE, CUBIC FEET PER SECOND  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.89	2.0	28	---	---	---	---	---	---	---	---	---
2	0.91	2.0	25	---	---	---	---	---	---	---	---	---
3	0.92	2.0	23	---	---	---	---	---	---	---	---	---
4	0.95	2.0	21	---	---	---	---	---	---	---	---	---
5	0.95	2.0	19	---	---	---	---	---	---	---	---	---
6	0.95	2.0	29	---	---	---	---	---	---	---	---	---
7	0.96	2.0	35	---	---	---	---	---	---	---	---	---
8	1.0	2.0	33	---	---	---	---	---	---	---	---	---
9	1.0	2.0	31	---	---	---	---	---	---	---	---	---
10	1.0	2.1	29	---	---	---	---	---	---	---	---	---
11	1.1	2.2	27	---	---	---	---	---	---	---	---	---
12	1.4	2.2	36	---	---	---	---	---	---	---	---	---
13	1.2	2.2	124	---	---	---	---	---	---	---	---	---
14	1.3	2.2	135	---	---	---	---	---	---	---	---	---
15	1.4	2.2	87	---	---	---	---	---	---	---	---	---
16	1.6	2.8	69	---	---	---	---	---	---	---	---	---
17	1.3	2.6	55	---	---	---	---	---	---	---	---	---
18	1.2	2.5	50	---	---	---	---	---	---	---	---	---
19	1.2	2.7	44	---	---	---	---	---	---	---	---	---
20	1.2	3.1	40	---	---	---	---	---	---	---	---	---
21	1.2	3.2	39	---	---	---	---	---	---	---	---	---
22	1.1	3.2	38	---	---	---	---	---	---	---	---	---
23	1.2	3.0	36	---	---	---	---	---	---	---	---	---
24	1.3	3.1	33	---	---	---	---	---	---	---	---	---
25	1.4	3.1	35	---	---	---	---	---	---	---	---	---
26	1.4	3.2	34	---	---	---	---	---	---	---	---	---
27	1.4	3.2	31	---	---	---	---	---	---	---	---	---
28	1.6	3.1	31	---	---	---	---	---	---	---	---	---
29	1.7	25	30	---	---	---	---	---	---	---	---	---
30	2.0	28	28	---	---	---	---	---	---	---	---	---
31	2.0	---	28	---	---	---	---	---	---	---	---	---
TOTAL	38.73	122.9	1,303	---	---	---	---	---	---	---	---	---
MEAN	1.25	4.10	42.0	---	---	---	---	---	---	---	---	---
MAX	2.0	28	135	---	---	---	---	---	---	---	---	---
MIN	0.89	2.0	19	---	---	---	---	---	---	---	---	---
AC-FT	77	244	2,580	---	---	---	---	---	---	---	---	---

CAL YR2003 TOTAL 17,667.90 MEAN 48.4 MAX 599 MIN 0.46 AC-FT 35040

## 14033500 UMATILLA RIVER NEAR UMATILLA, OR

LOCATION.--Lat 45°54'11", long 119°19'33", in SW ¼ NW ¼ sec.21, T.5 N., R.28 E., Umatilla County, Hydrologic Unit 17070103, on left bank, 1.2 mi southeast of Umatilla, 1.6 mi downstream from West Extension main canal of Umatilla project, and at mile 2.1.

DRAINAGE AREA.--2,290 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--October 1903 to current year.

REVISED RECORDS.--WSP 794: Drainage area. WSP 1398: 1909, 1911, 1914, 1928, 1935.

GAGE.--Water-stage recorder. Datum of gage is 330.47 ft above NGVD of 1929. Oct. 21, 1903, to Jan. 25, 1931, nonrecording gage.

REMARKS.--No estimated daily discharges. Records fair. Some regulation since 1927 by McKay Reservoir. Many diversions upstream from station for irrigation of lands upstream and downstream from station; Brownell Canal diverts downstream from station. Diversions since 1908 to Cold Springs Reservoir, an off-channel reservoir, capacity, 52,380 acre-ft. Continuous water-quality records for the period October 1962 to September 1969 have been collected at this location. U.S. Bureau of Reclamation satellite telemeter at station.

AVERAGE DISCHARGE.--77 years (water years 1928-2004), 477 ft<sup>3</sup>/s, 345,900 acre-ft/yr. Water years prior to 1928 not included in computation of average discharge owing to increased regulation and diversion since 1927.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 19,800 ft<sup>3</sup>/s Jan. 30, 1965, gage height, 10.75 ft; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,100 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan 30	0715	*4,650	*5.77	May 29	1300	4,210	5.59
May 24	1545	4,400	5.67				

Minimum discharge, 7.8 ft<sup>3</sup>/s, Aug. 12.

DISCHARGE, CUBIC FEET PER SECOND  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	201	246	427	398	2,110	708	1,470	622	1,850	189	38	84
2	200	246	392	378	1,570	646	1,100	599	1,510	148	30	89
3	199	247	439	366	1,220	585	875	579	1,170	134	29	92
4	200	263	423	356	1,000	558	725	557	831	140	39	99
5	200	254	403	350	832	589	787	587	608	138	32	91
6	203	250	367	350	698	630	916	690	508	121	27	94
7	203	249	434	355	680	685	935	554	414	101	35	88
8	211	250	540	379	637	682	906	488	422	75	42	88
9	211	251	505	660	574	888	829	450	691	64	27	90
10	213	249	456	656	519	1,610	746	384	832	50	19	92
11	208	249	423	995	465	1,860	670	362	1,980	29	24	101
12	217	254	387	982	417	1,600	587	531	1,620	28	13	104
13	217	259	392	813	384	1,540	579	1,340	1,350	22	29	122
14	219	256	872	696	363	1,630	650	1,370	1,010	21	46	160
15	222	255	1,280	578	351	1,480	700	1,110	719	20	35	194
16	231	254	860	568	363	1,520	724	998	534	30	74	191
17	231	253	599	717	660	1,520	561	1,080	400	61	84	182
18	225	268	452	776	1,140	1,730	562	945	280	63	91	201
19	223	271	383	667	1,400	1,920	563	1,360	272	55	91	199
20	219	271	371	556	1,390	1,850	541	1,510	288	45	99	192
21	217	276	356	446	1,210	1,460	612	1,680	271	32	97	186
22	217	273	322	352	1,060	1,370	828	1,860	225	34	101	183
23	211	254	336	372	926	1,610	976	1,750	213	12	123	182
24	212	228	337	628	847	1,860	1,040	3,540	210	25	129	173
25	215	202	336	1,590	868	1,720	933	3,870	211	31	139	192
26	218	179	325	1,020	838	1,430	819	3,280	217	34	124	197
27	218	160	326	776	811	1,310	727	3,000	234	30	92	195
28	214	150	328	649	809	1,170	784	3,280	217	36	78	193
29	211	154	359	2,020	771	1,030	823	4,090	188	27	72	193
30	217	240	371	4,530	---	1,050	701	3,640	183	30	79	193
31	231	---	411	3,250	---	1,470	---	2,380	---	29	71	---
TOTAL	6,634	7,211	14,212	27,229	24,913	39,711	23,669	48,486	19,458	1,854	2,009	4,440
MEAN	214	240	458	878	859	1,281	789	1,564	649	59.8	64.8	148
MAX (WY)	231 (1928)	276 (1928)	1,280 (1974)	4,530 (1965)	2,110 (1996)	1,920 (1972)	1,470 (1958)	4,090 (1948)	1,980 (1950)	189 (1942)	139 (1993)	201 (1998)
MIN (WY)	199 (1978)	150 (1932)	322 (1988)	350 (1930)	351 (1977)	558 (1977)	541 (1968)	362 (1977)	183 (1979)	12 (1985)	13 (1985)	84 (1987)
AC-FT	13,160	14,300	28,190	54,010	49,410	78,770	46,950	96,170	38,590	3,680	3,980	8,810

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1928 - 2004, BY WATER YEAR (WY)

MEAN	111	271	539	720	957	1,162	1,155	617	137	22.3	24.4	47.1
MAX (WY)	481 (1928)	1,302 (1928)	1,948 (1974)	2,366 (1965)	3,786 (1996)	3,678 (1972)	3,056 (1958)	3,362 (1948)	805 (1950)	149 (1942)	95.0 (1993)	153 (1998)
MIN (WY)	4.18 (1978)	40.2 (1932)	70.8 (1988)	89.3 (1930)	86.7 (1977)	154 (1977)	4.56 (1968)	1.55 (1977)	1.33 (1979)	0.81 (1985)	1.04 (1985)	0.59 (1987)

## 14033500 UMATILLA RIVER NEAR UMATILLA, OR—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1928 - 2004	
ANNUAL TOTAL	182,469.1		219,826			
ANNUAL MEAN	500		601		477	
HIGHEST ANNUAL MEAN					1,026	1997
LOWEST ANNUAL MEAN					77.5	1977
HIGHEST DAILY MEAN	4,650	Jan 31	4,530	Jan 30	15,600	Jan 30, 1965
LOWEST DAILY MEAN	1.3	Jul 29	12	Jul 23	0.00	Apr 20, 1930
ANNUAL SEVEN-DAY MINIMUM	1.6	Jul 20	27	Aug 6	0.00	Oct 18, 1931
ANNUAL RUNOFF (AC-FT)	361,900		436,000		345,900	
10 PERCENT EXCEEDS	1,260		1,470		1,330	
50 PERCENT EXCEEDS	257		363		160	
90 PERCENT EXCEEDS	12		62		6.2	



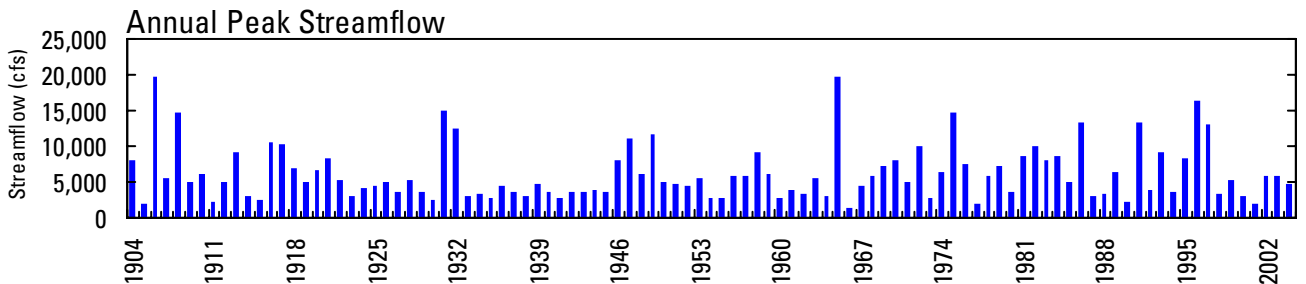
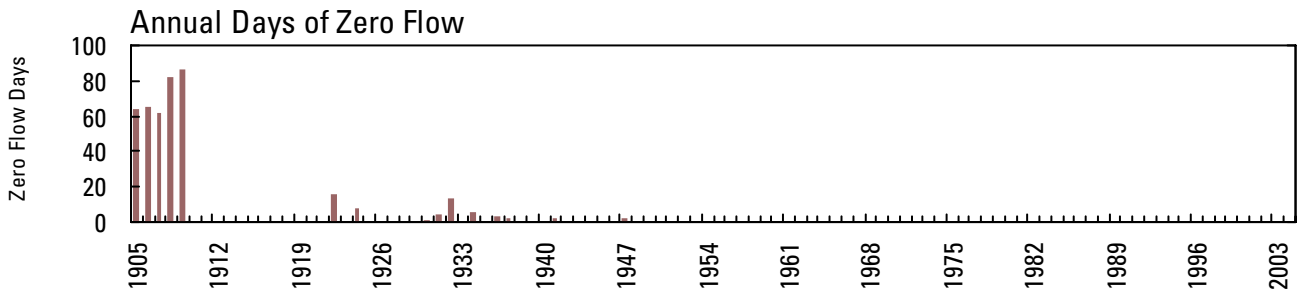
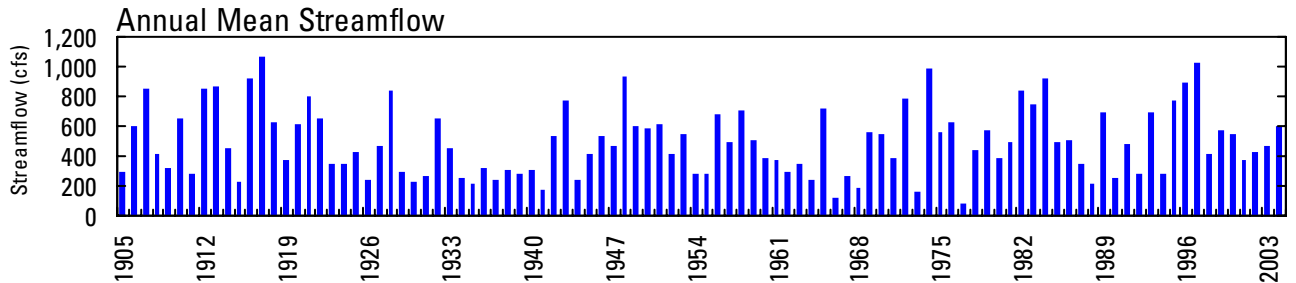
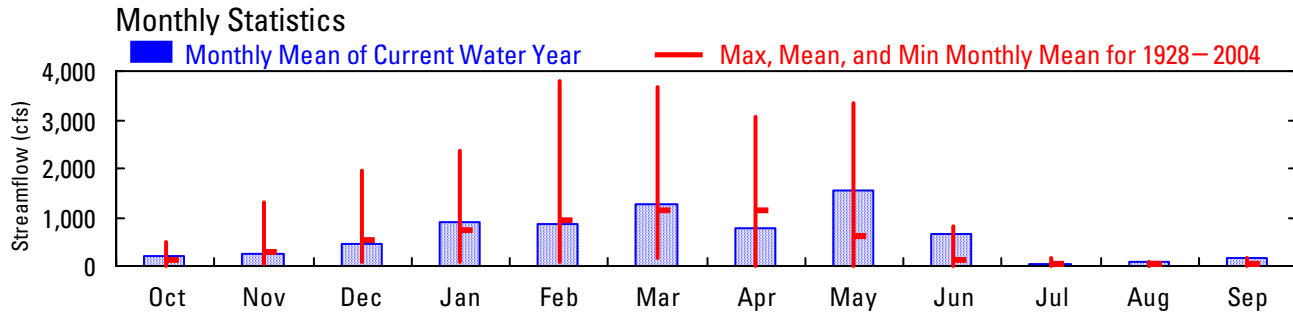
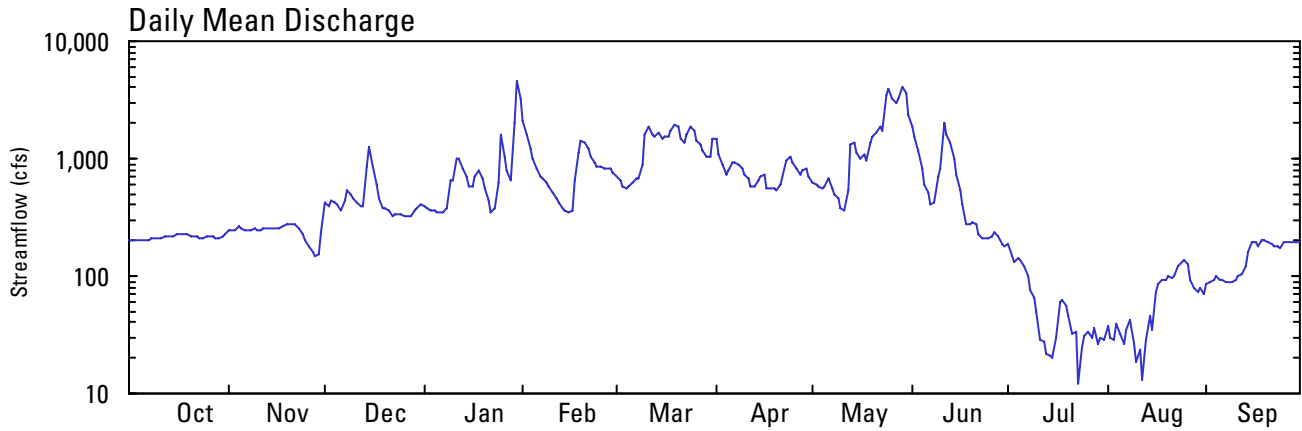
2004 Water Year  
UMATILLA RIVER BASIN

14033500 UMATILLA RIVER NEAR UMATILLA, OR

Latitude: 45° 54' 11"  
Umatilla County

Longitude: 119° 19' 33"  
Datum: 330.47 feet

Hydrologic Unit Code: 17070103  
Drainage Area: 2,290 square miles



## 14034470 WILLOW CREEK ABOVE WILLOW CREEK LAKE, NEAR HEPPNER, OR

LOCATION.--Lat 45°20'27", long 119°30'53", in NE ¼ NE ¼ sec.1, T.3 S., R.26 E., Morrow County, Hydrologic Unit 17070104, on right bank 1.5 mi southeast of Heppner, 1.7 mi upstream from Willow Creek dam, and at mile 54.1.

DRAINAGE AREA.--67.6 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1982 to current year.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 2,085.41 ft above NGVD of 1929 (levels by Corps of Engineers).

REMARKS.--Records fair except for estimated daily discharges, which are poor. Many diversions for irrigation upstream from station. Part of flow of Ditch Creek (John Day River basin) is diverted to Willow Creek upstream from station. Chemical analysis May 1985 to September 1987.

AVERAGE DISCHARGE.--22 years (water years 1983-2004), 20.9 ft<sup>3</sup>/s, 15,150 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 544 ft<sup>3</sup>/s Feb. 1, 1997, gage height, 9.60 ft, from crest-stage gage; minimum discharge, no flow several days in August 2000, Aug. 27 to Oct. 7, 2001, and may have been no flow during period of no gage-height record July 31 to Sept. 14, 1988.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 140 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan 30	unkn	275	a8.15	May 28	unkn	*341	*a8.53

Minimum discharge, 0.08 ft<sup>3</sup>/s, Oct. 4.

a From crest-stage gage.

DISCHARGE, CUBIC FEET PER SECOND  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.09	1.2	5.3	7.8	60	30	35	28	80	8.3	1.0	1.1
2	0.10	2.3	4.3	7.3	50	29	32	25	63	8.0	1.1	1.1
3	0.09	2.4	3.8	7.1	43	28	29	23	53	7.7	1.2	1.2
4	0.09	2.5	3.4	4.6	39	28	27	19	45	7.3	0.91	1.1
5	0.10	1.9	3.3	3.6	34	27	28	17	39	6.3	1.0	1.0
6	0.10	1.9	3.8	5.8	32	26	29	18	36	2.0	1.3	0.98
7	0.11	2.6	4.3	8.3	31	25	29	16	35	0.29	1.2	0.79
8	0.17	3.1	3.4	8.7	29	28	30	17	35	2.1	1.1	0.73
9	0.24	3.2	3.0	40	27	37	28	17	32	3.4	0.85	0.83
10	0.32	3.2	2.9	62	26	46	26	17	66	3.6	0.58	1.1
11	0.45	3.6	3.0	41	24	46	24	22	60	2.9	0.47	1.2
12	0.86	3.6	4.6	33	22	44	23	25	51	3.0	0.44	2.1
13	0.98	3.4	7.7	29	22	44	25	22	44	2.7	0.44	2.9
14	0.95	3.3	12	27	21	42	24	19	39	2.7	0.47	3.7
15	1.3	3.1	7.7	28	21	44	29	17	35	2.6	0.53	3.1
16	1.8	3.4	6.5	32	24	40	27	19	31	2.3	0.44	4.5
17	1.5	3.6	5.7	31	39	43	26	16	28	2.8	0.73	3.3
18	1.1	3.3	5.2	28	57	43	26	28	25	2.8	0.51	4.1
19	0.95	3.4	5.0	26	60	50	26	40	22	2.2	0.37	3.3
20	0.90	3.5	5.6	24	54	47	28	37	19	2.5	0.29	3.0
21	0.81	3.4	6.4	21	49	42	35	36	17	2.2	0.25	2.6
22	0.92	3.1	6.0	18	44	44	43	35	16	1.7	1.1	2.3
23	0.80	3.2	5.6	22	40	51	51	e150	14	1.4	2.5	2.1
24	0.90	3.8	6.0	63	37	52	50	e160	13	1.2	1.7	2.0
25	1.1	3.4	8.4	58	35	48	45	e145	11	0.98	2.1	1.8
26	1.1	4.0	7.2	49	36	48	41	132	11	0.86	2.9	1.7
27	1.1	3.3	7.6	42	33	39	37	121	10	0.75	3.0	1.6
28	1.0	3.7	7.9	43	32	32	37	e200	9.5	0.72	2.0	1.5
29	1.7	5.5	6.8	e120	32	33	35	e190	9.5	0.66	1.6	1.4
30	2.6	6.6	4.7	e130	---	36	30	e120	9.3	0.72	1.3	1.4
31	2.2	---	8.0	e85	---	39	---	101	---	1.2	1.3	---
TOTAL	26.43	98.5	175.1	1,105.2	1,053	1,211	955	1,832	958.3	87.88	34.68	59.53
MEAN	0.85	3.28	5.65	35.7	36.3	39.1	31.8	59.1	31.9	2.83	1.12	1.98
MAX	2.6	6.6	12	130	60	52	51	200	80	8.3	3.0	4.5
MIN	0.09	1.2	2.9	3.6	21	25	23	16	9.3	0.29	0.25	0.73
AC-FT	52	195	347	2,190	2,090	2,400	1,890	3,630	1,900	174	69	118

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1983 - 2004, BY WATER YEAR (WY)

MEAN	3.03	7.42	14.4	21.6	35.6	56.7	48.5	41.0	17.0	3.88	1.34	1.44
MAX	7.10	21.2	72.8	78.2	109	128	116	110	55.4	11.2	3.99	6.13
(WY)	(1983)	(1987)	(1997)	(1997)	(1996)	(1993)	(1984)	(1995)	(1984)	(1993)	(1997)	(1984)
MIN	0.20	1.45	3.15	6.68	7.52	9.81	11.9	2.73	1.60	0.51	0.01	0.00
(WY)	(1989)	(2003)	(2002)	(1990)	(1994)	(1988)	(1992)	(1992)	(1992)	(2003)	(1988)	(2001)

## WILLOW CREEK BASIN

14034470 WILLOW CREEK ABOVE WILLOW CREEK LAKE, NEAR HEPPNER, OR—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1983 - 2004	
ANNUAL TOTAL	4,651.16		7,596.62			
ANNUAL MEAN	12.7		20.8		20.9	
HIGHEST ANNUAL MEAN					44.3	1984
LOWEST ANNUAL MEAN					6.13	2002
HIGHEST DAILY MEAN	83	Mar 16	200	May 28	450	Feb 1, 1997
LOWEST DAILY MEAN	0.01	Aug 4	0.09	Oct 1	0.00	Aug 11, 2000
ANNUAL SEVEN-DAY MINIMUM	0.03	Jul 31	0.10	Oct 1	0.00	Aug 11, 2000
ANNUAL RUNOFF (AC-FT)	9,230		15,070		15,150	
10 PERCENT EXCEEDS	41		46		57	
50 PERCENT EXCEEDS	4.8		7.8		8.0	
90 PERCENT EXCEEDS	0.08		0.89		0.63	

e Estimated



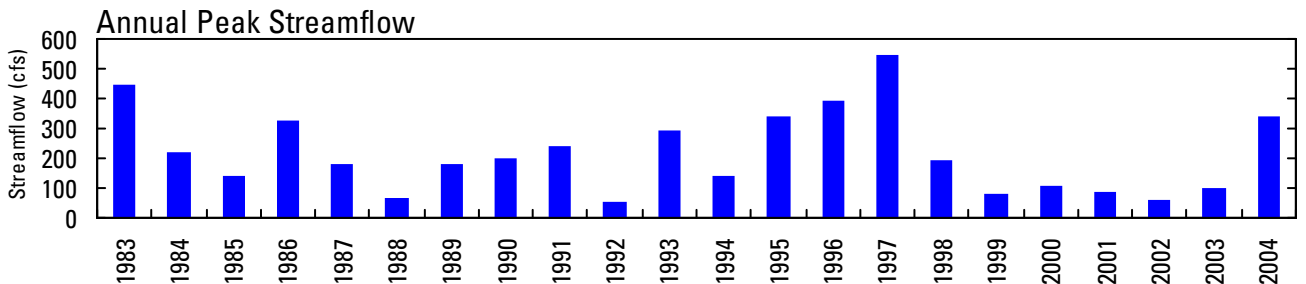
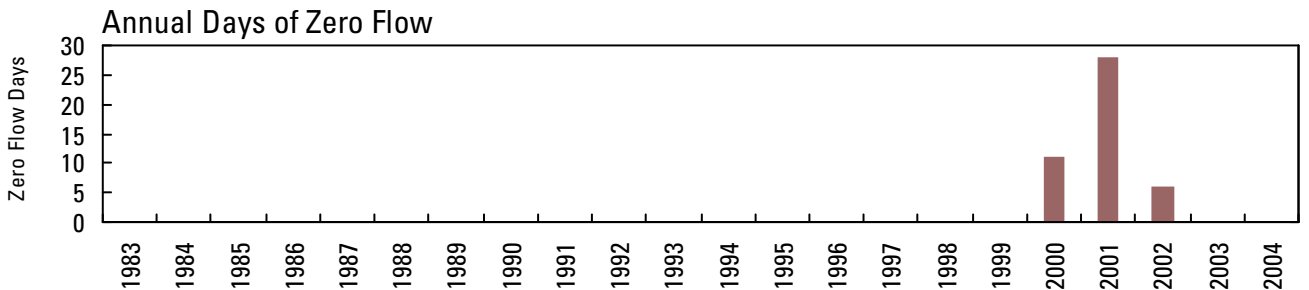
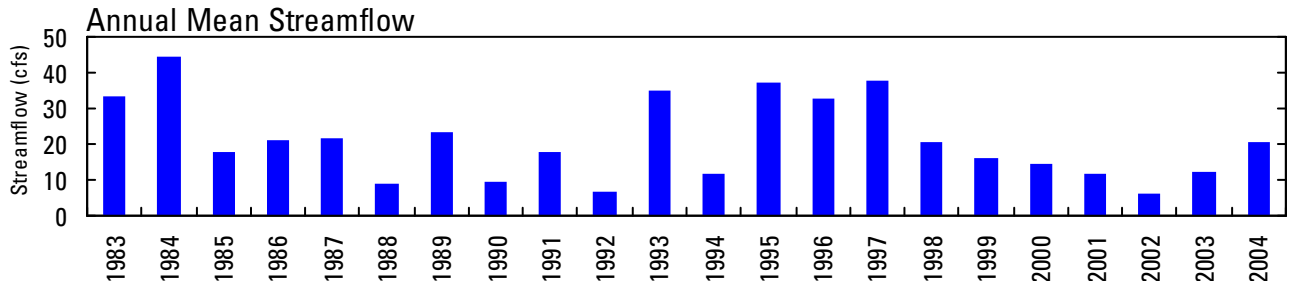
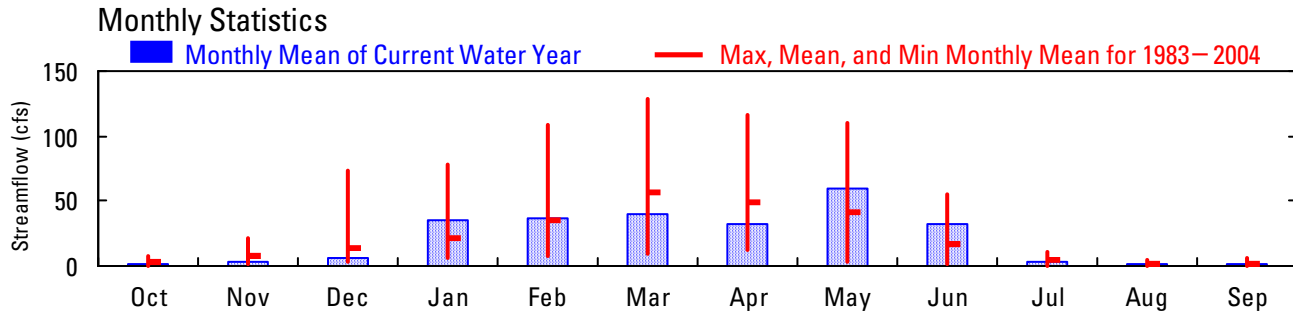
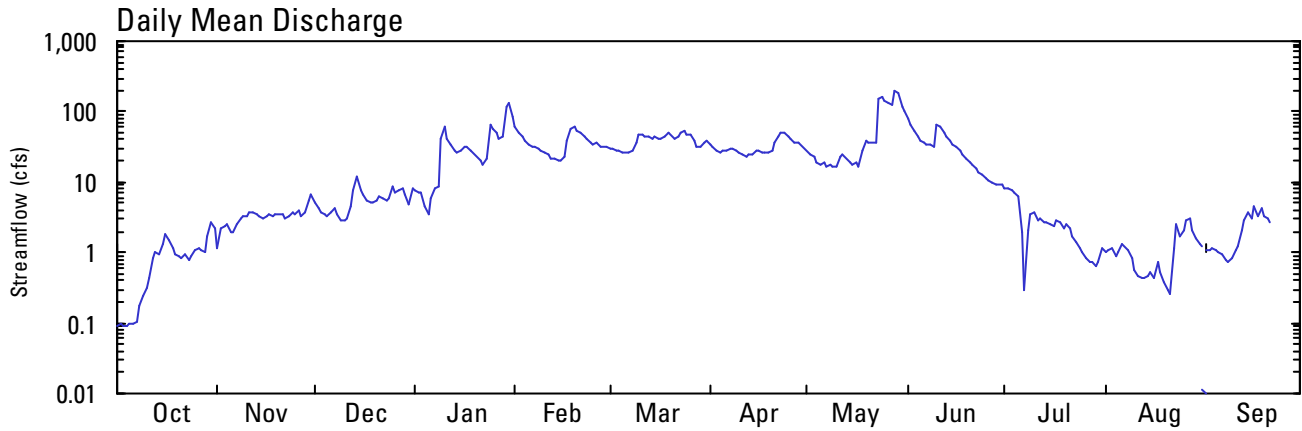
2004 Water Year  
WILLOW CREEK BASIN

14034470 WILLOW CREEK ABV WILLOW CR LAKE, NR HEPPNER, OR

Latitude: 45° 20 ' 27"  
Morrow County

Longitude: 119° 30 ' 53"  
Datum: 2,085.41 feet

Hydrologic Unit Code: 17070104  
Drainage Area: 67.6 square miles





## WILLOW CREEK BASIN

## 14034490 WILLOW CREEK LAKE AT HEPPNER, OR

LOCATION.--Lat 45°20'50", long 119°32'37", in NW ¼ SE ¼ sec.35, T.2 S., R.26 E., Morrow County, Hydrologic Unit 17070104, U.S. Corps of Engineers land, on top left side of spillway on dam on Willow Creek, 2,000 ft upstream from Court Street bridge and at mile 52.4.

DRAINAGE AREA.--96.6 mi<sup>2</sup>.

PERIOD OF RECORD.--February 1983 to current year.

GAGE.--Water-stage recorder. Datum of gage is NGVD of 1929 (levels by Corps of Engineers). Prior to Dec. 22, 1983, nonrecording gage at nearby site at present datum. U.S. Geological Survey satellite telemeter at station.

REMARKS.--Lake is formed behind roller-compacted, concrete dam; storage began Feb. 16, 1983. Capacity, 14,020 acre-ft between elevations 2,000.0 ft, sill of outlet gates, and 2,113.5 ft, crest of spillway. Average minimum lake elevation 2,047.0 ft, storing 2,540 acre-ft. Dead storage, 73 acre-ft below elevation 2,000.0 ft. Reservoir used for flood control. Figures given herein represent total contents. U.S. Geological Survey satellite telemeter at station.

COOPERATION.--Capacity table furnished by Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 7,340 acre-ft May 8, 1995, elevation, 2,083.06 ft; no usable contents at times.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 6,940 acre-ft May 26, elevation, 2,080.72 ft; minimum contents, 3,790 acre-ft Nov. 18, elevation, 2,058.67 ft.

Capacity Table (elevation, in feet and contents, in acre-feet)

2,050	2,840	2,060	3,950	2,070	5,280	2,080	6,820
2,055	3,370	2,065	4,590	2,075	6,020		

CORRECTION.--The published change in contents for calendar years 1999-2001 and water years 2000-2002 were in error.

The correct values are listed below in acre-feet:

WTR YR	1999	AC-FT‡	---	WTR YR	2,000	AC-FT‡	-60	WTR YR	2001	AC-FT‡	-70	WTR YR	2002	AC-FT‡	-810
CAL YR	1999	AC-FT‡	-190	CAL YR	2,000	AC-FT‡	+50	CAL YR	2001	AC-FT‡	-130	CAL YR	2002	AC-FT‡	---

‡ Change in contents, in acre-feet.

ELEVATION ABOVE NGVD 1929, FEET  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY OBSERVATION AT 2400 HOURS

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2,060.66	2,059.20	2,058.78	2,060.27	2,064.32	2,063.07	2,072.11	2,075.95	2,077.79	2,077.44	2,075.15	2,068.88
2	2,060.59	2,059.17	2,058.81	2,060.34	2,063.95	2,063.34	2,072.29	2,075.95	2,077.53	2,077.44	2,074.91	2,068.74
3	2,060.52	2,059.14	2,058.79	2,060.39	2,063.47	2,063.62	2,072.49	2,076.07	2,077.31	2,077.43	2,074.67	2,068.65
4	2,060.46	2,059.10	2,058.78	2,060.42	2,063.29	2,063.87	2,072.67	2,076.16	2,077.08	2,077.41	2,074.45	2,068.54
5	2,060.40	2,059.07	2,058.82	2,060.40	2,063.25	2,064.11	2,072.86	2,076.24	2,076.77	2,077.39	2,074.23	2,068.45
6	2,060.33	2,059.03	2,058.82	2,060.42	2,063.19	2,064.34	2,073.06	2,076.33	2,076.44	2,077.30	2,074.01	2,068.36
7	2,060.27	2,059.01	2,058.85	2,060.46	2,063.10	2,064.54	2,073.25	2,076.40	2,076.23	2,077.18	2,073.79	2,068.26
8	2,060.20	2,058.98	2,058.85	2,060.52	2,062.98	2,064.78	2,073.46	2,076.48	2,076.18	2,077.13	2,073.59	2,068.17
9	2,060.12	2,058.97	2,058.85	2,060.88	2,062.89	2,065.16	2,073.66	2,076.57	2,076.30	2,077.09	2,073.39	2,068.08
10	2,060.06	2,058.96	2,058.87	2,060.79	2,062.89	2,065.69	2,073.83	2,076.65	2,076.86	2,077.06	2,073.19	2,067.99
11	2,060.01	2,058.94	2,058.87	2,060.55	2,062.89	2,066.21	2,073.97	2,076.63	2,077.31	2,077.02	2,072.98	2,067.92
12	2,059.95	2,058.92	2,058.94	2,060.29	2,062.86	2,066.68	2,074.09	2,076.60	2,077.63	2,076.98	2,072.77	2,067.83
13	2,059.90	2,058.90	2,059.06	2,060.39	2,062.83	2,067.16	2,074.29	2,076.53	2,077.85	2,076.94	2,072.57	2,067.78
14	2,059.85	2,058.89	2,059.19	2,060.72	2,062.78	2,067.59	2,074.53	2,076.48	2,078.01	2,076.89	2,072.36	2,067.73
15	2,059.81	2,058.87	2,059.27	2,061.07	2,062.72	2,068.03	2,074.88	2,076.44	2,078.13	2,076.83	2,072.16	2,067.67
16	2,059.77	2,058.86	2,059.31	2,061.46	2,062.87	2,068.37	2,075.16	2,076.40	2,078.20	2,076.78	2,071.96	2,067.65
17	2,059.73	2,058.85	2,059.36	2,061.84	2,062.99	2,068.63	2,075.42	2,076.37	2,078.22	2,076.74	2,071.75	2,067.65
18	2,059.67	2,058.85	2,059.39	2,062.18	2,063.28	2,068.88	2,075.67	2,076.55	2,078.20	2,076.69	2,071.55	2,067.62
19	2,059.62	2,058.82	2,059.42	2,062.48	2,063.62	2,069.25	2,075.94	2,076.79	2,078.15	2,076.64	2,071.33	2,067.59
20	2,059.58	2,058.81	2,059.47	2,062.74	2,063.88	2,069.56	2,076.21	2,076.65	2,078.08	2,076.59	2,071.13	2,067.56
21	2,059.53	2,058.79	2,059.53	2,062.97	2,064.03	2,069.80	2,076.41	2,076.48	2,077.97	2,076.52	2,070.92	2,067.53
22	2,059.47	2,058.77	2,059.59	2,063.02	2,064.08	2,070.07	2,076.60	2,076.35	2,077.84	2,076.41	2,070.77	2,067.50
23	2,059.41	2,058.76	2,059.67	2,063.09	2,064.05	2,070.40	2,076.68	2,077.67	2,077.69	2,076.32	2,070.58	2,067.49
24	2,059.35	2,058.75	2,059.68	2,063.34	2,063.92	2,070.77	2,076.69	2,079.74	2,077.57	2,076.22	2,070.39	2,067.48
25	2,059.30	2,058.74	2,059.76	2,063.10	2,063.81	2,071.08	2,076.66	2,080.54	2,077.55	2,076.09	2,070.20	2,067.47
26	2,059.26	2,058.72	2,059.83	2,062.80	2,063.66	2,071.39	2,076.57	2,080.52	2,077.50	2,075.99	2,070.03	2,067.46
27	2,059.20	2,058.69	2,059.91	2,062.69	2,063.46	2,071.53	2,076.44	2,080.00	2,077.47	2,075.88	2,069.85	2,067.45
28	2,059.18	2,058.70	2,060.02	2,062.74	2,063.27	2,071.59	2,076.39	2,079.67	2,077.43	2,075.77	2,069.67	2,067.44
29	2,059.20	2,058.72	2,060.10	2,063.71	2,063.06	2,071.66	2,076.30	2,079.37	2,077.44	2,075.66	2,069.48	2,067.41
30	2,059.20	2,058.75	2,060.11	2,064.46	---	2,071.82	2,076.14	2,078.87	2,077.45	2,075.54	2,069.28	2,067.39
31	2,059.20	---	2,060.19	2,064.52	---	2,072.00	---	2,078.15	---	2,075.37	2,069.10	---
MAX	2,060.66	2,059.20	2,060.19	2,064.52	2,064.32	2,072.00	2,076.69	2,080.54	2,078.22	2,077.44	2,075.15	2,068.88
MIN	2,059.18	2,058.69	2,058.78	2,060.27	2,062.72	2,063.07	2,072.11	2,075.95	2,076.18	2,075.37	2,069.10	2,067.39
(+)	3,860	3,800	3,980	4,520	4,330	5,560	6,190	6,510	6,400	6,070	5,150	4,910
(±)	-180	-60	+180	+540	-190	+1,230	+630	+320	-110	-330	-920	-240
CAL YR	2003	MAX	2,077.00	MIN	2058.69	AC-FT	-380					
WTR YR	2004	MAX	2,080.54	MIN	2058.69	AC-FT	+870					

† Contents, in acre-feet, at 2400, on last day of month.

‡ Change in contents, in acre-feet.

## 14034500 WILLOW CREEK AT HEPPNER, OR

LOCATION.--Lat 45°21'02", long 119°32'56", in SE ¼ NW ¼ sec.35, T.2 S., R.26 E., Morrow County, Hydrologic Unit 17070104, on right bank at Heppner, 100 ft upstream from Court Street bridge, 800 ft southeast of Morrow County courthouse, 0.2 mi downstream from Willow Creek Dam and at mile 52.2.

DRAINAGE AREA.--96.8 mi<sup>2</sup>.

PERIOD OF RECORD.--May 1951 to current year.

REVISED RECORDS.--WDR OR-83-1: Drainage area.

GAGE.--Water-stage recorder. Concrete control since September 1985. Datum of gage is 1,952.73 ft above NGVD of 1929.

REMARKS.--No estimated daily discharges. Records good except those below 2 ft<sup>3</sup>/s, which are fair. Flow regulated by Willow Creek Lake, 0.2 mi upstream, since Feb. 16, 1983. Many diversions for irrigation upstream from station. Part of flow of Ditch Creek (John Day River basin) is diverted to Willow Creek upstream from station. Continuous water-quality records for the period February 1963 to June 1968 and March 1972 to September 1973 have been collected at this location. Chemical analysis Oct. 1984 to September 1987.

AVERAGE DISCHARGE.--31 years (water years 1952-82), 19.1 ft<sup>3</sup>/s, 13,840 acre-ft/yr. 22 years (water years 1983-2004), 21.6 ft<sup>3</sup>/s, 15,630 acre-ft/yr, regulated period.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 812 ft<sup>3</sup>/s May 10, 1957, gage height, 6.15 ft, from rating curve extended above 230 ft<sup>3</sup>/s; maximum gage height, 6.46 ft May 25, 1971, backwater from Shobe Canyon; no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge, about 36,000 ft<sup>3</sup>/s June 14, 1903, result of slope-area measurement (see WSP 96). Discharge for flood of Feb. 22, 1949, was 1,700 ft<sup>3</sup>/s, result of slope-area measurement.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 163 ft<sup>3</sup>/s May 26, gage height, 4.41 ft; minimum discharge, 0.49 ft<sup>3</sup>/s part or all of each day Oct. 31, Nov. 1.

DISCHARGE, CUBIC FEET PER SECOND  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.4	1.0	2.8	2.7	83	31	23	43	112	8.1	17	14
2	3.4	2.7	2.8	2.6	83	11	16	24	88	8.1	17	9.8
3	3.4	2.7	2.7	2.3	83	11	10	12	77	8.1	17	6.8
4	3.4	2.7	2.4	2.4	55	11	10	11	69	8.1	17	6.8
5	3.4	2.7	2.4	3.3	39	11	10	10	69	8.1	17	6.8
6	3.4	2.7	2.5	4.4	39	11	11	11	68	8.1	17	6.8
7	3.4	2.7	2.5	4.5	39	11	11	11	57	6.8	17	6.8
8	3.4	2.7	2.4	4.5	39	11	11	9.7	42	5.5	15	6.7
9	3.4	2.4	2.4	4.5	34	11	10	9.7	28	5.5	15	6.7
10	3.3	2.3	2.4	35	27	11	10	9.8	19	5.4	15	6.7
11	3.3	2.3	2.4	35	25	11	11	19	23	5.4	15	6.7
12	3.3	2.3	2.5	31	25	11	11	25	26	5.4	15	6.7
13	3.3	2.5	2.4	13	25	11	8.8	24	26	5.4	15	6.7
14	3.3	2.7	2.5	2.2	25	11	4.3	22	26	5.4	15	6.7
15	3.3	2.7	2.6	2.4	24	11	4.3	19	26	5.4	15	6.7
16	3.3	2.7	2.5	2.4	17	14	4.2	19	26	5.3	15	5.3
17	3.3	2.7	2.5	2.4	32	21	4.0	19	26	5.3	15	4.4
18	3.3	2.7	2.5	2.4	44	22	4.0	15	26	5.3	15	4.4
19	3.3	2.7	2.5	2.4	44	22	3.9	18	26	5.3	15	4.4
20	3.3	2.7	2.5	2.4	45	22	3.8	48	26	5.3	15	4.4
21	3.3	2.7	2.5	2.4	45	22	19	48	26	6.2	15	4.4
22	3.3	2.7	2.5	7.4	45	23	26	47	26	7.4	15	4.4
23	3.3	2.7	2.6	9.7	46	24	41	46	26	7.4	15	3.2
24	3.3	2.7	2.7	34	46	24	48	58	22	7.4	15	2.5
25	3.1	2.7	2.5	56	46	24	48	85	13	7.4	14	2.5
26	2.8	2.7	2.5	60	46	24	48	124	13	7.4	14	2.5
27	2.8	2.7	2.5	53	46	24	45	157	13	7.4	14	2.5
28	1.8	2.7	2.6	46	46	24	43	156	13	7.4	14	2.5
29	0.68	2.8	2.7	46	46	23	43	155	10	7.4	14	2.5
30	0.62	2.8	2.7	60	---	22	43	155	8.1	7.4	14	2.5
31	0.49	---	2.6	83	---	22	---	153	---	12	14	---
TOTAL	92.39	77.8	78.6	619.3	1,239	542	585.3	1,563.2	1,056.1	210.1	472	163.8
MEAN	2.98	2.59	2.54	20.0	42.7	17.5	19.5	50.4	35.2	6.78	15.2	5.46
MAX	3.4	2.8	2.8	83	83	31	48	157	112	12	17	14
MIN	0.49	1.0	2.4	2.2	17	11	3.8	9.7	8.1	5.3	14	2.5
AC-FT	183	154	156	1,230	2,460	1,080	1,160	3,100	2,090	417	936	325

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1983 - 2004, BY WATER YEAR (WY)

MEAN	6.82	12.1	13.6	24.0	31.6	48.7	45.4	42.8	18.9	6.26	5.30	4.14
MAX	15.6	26.3	48.3	110	110	115	152	127	54.2	11.5	15.2	12.4
(WY)	(1994)	(1997)	(1997)	(1997)	(1996)	(1983)	(1984)	(1995)	(1984)	(2003)	(2004)	(1988)
MIN	1.93	1.69	2.54	3.40	5.81	4.40	10.4	2.15	2.17	2.39	2.34	2.56
(WY)	(1992)	(1992)	(2004)	(1991)	(2002)	(2002)	(1994)	(1992)	(1992)	(1987)	(1983)	(1991)

## WILLOW CREEK BASIN

14034500 WILLOW CREEK AT HEPPNER, OR—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1983 - 2004	
ANNUAL TOTAL	4,092.29		6,699.59			
ANNUAL MEAN	11.2		18.3		21.6	
HIGHEST ANNUAL MEAN					45.5	1984
LOWEST ANNUAL MEAN					5.99	2002
HIGHEST DAILY MEAN	54	Feb 1	157	May 27	306	May 6, 1983
LOWEST DAILY MEAN	0.49	Oct 31	0.49	Oct 31	0.48	Aug 4, 1983
ANNUAL SEVEN-DAY MINIMUM	1.4	Oct 28	1.4	Oct 28	1.3	Aug 1, 1983
ANNUAL RUNOFF (AC-FT)	8,120		13,290		15,630	
10 PERCENT EXCEEDS	28		46		52	
50 PERCENT EXCEEDS	5.4		10		9.2	
90 PERCENT EXCEEDS	2.7		2.5		2.8	



2004 Water Year  
WILLOW CREEK BASIN

**14034500 WILLOW CREEK AT HEPPNER, OR**

Latitude: 45° 21 ' 02"  
Morrow County

Longitude: 119° 32 ' 56"  
Datum: 1,952.73 feet

Hydrologic Unit Code: 17070104  
Drainage Area: 96.8 square miles

