Water-Data Report 2011

12439500 OKANOGAN RIVER AT OROVILLE, WA

Upper Columbia Basin
Okanogan Subbasin

LOCATION.--Lat 48°55′51″, long 119°25′09″ referenced to North American Datum of 1927, in SE ¼ SW ¼ sec.27, T.40 N., R.27 E., Okanogan County, WA, Hydrologic Unit 17020006, base gage on left bank in Oroville, 20 ft downstream from Burlington Northern trestle, 0.5 mi downstream from Tonasket Creek, 1.7 mi downstream from Osoyoos Lake, 3.2 mi upstream from Similkameen River, and at mile 77.3. The auxillary gage is located 0.5 mi downstream at mile 76.8.

DRAINAGE AREA.--3,195 mi^2.

SURFACE-WATER RECORDS

PERIOD OF RECORD.--October 1942 to current year.

REVISED RECORDS.--WDR WA-75-1: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is NGVD of 1929. Prior to Oct. 26, 1944, nonrecording gage at Zosel Mill dam 200 ft upstream, Oct. 26, 1944, to Mar. 6, 1948, water-stage recorder on railroad trestle 20 ft upstream, both at same datum. Auxiliary water-stage recorder 0.5 mi downstream used during high-water periods; May 15, 1946, to Apr. 9, 1948, nonrecording gage at same site, both at datum 900.00 ft above NGVD of 1929. To convert to 1947 joint adjustment of U.S. Coast and Geodetic Survey and Geodetic Survey of Canada, subtract 0.26 ft.

COOPERATION.--This station is maintained by the United States under agreement with Canada.

REMARKS.--Records good except for backwater periods May 15 - July 20 which are fair. Diversions made to irrigate approximately 44,000 acres in Canada and minor diversions in the United States upstream from station. Natural regulation in several large lakes and artificial regulation in Okanagan Lake 46.7 mi upstream for flood control and irrigation; also regulated by Zosel dam at Oroville, 500 ft upstream from gage. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE FOR PERIOD OF RECORD.--69 years (water years 1943-2011), 669 ft^3/s, 485,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,770 ft^3/s June 7, 1997; maximum elevation, 916.89 ft June 2, 1972, at datum then in use, backwater from Similkameen River; minimum daily discharge, -2,270 ft^3/s reverse flow May 29, 1948; minimum elevation, 903.98 ft Mar. 1, 1948, at datum then in use.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,020 ft^3/s, May 29, elevation, 911.23 ft, June 17, elevation, 911.97 ft; maximum elevation, 913.85 ft, June 10, 11, result of backwater from Similkameen River and regulation at Zosel Dam; minimum discharge, 50 ft^3/s, Dec. 31, but may have been lower on this day, elevation 905.67 ft, result of frozen gates at Zosel Dam; minimum elevation 905.46 ft (below rating), Dec. 31, result of frozen gates at Zosel Dam.

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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	445	400	363	290	204	142	288	803	2,830	2,390	2,090	199
2	445	400	360	293	183	118	288	741	2,840	2,480	2,060	159
3	445	395	336	290	181	103	288	691	2,810	2,470	2,050	157
4	445	392	324	266	181	103	302	691	2,730	2,410	2,020	157
5	442	389	323	194	179	103	313	744	2,570	2,380	1,930	197
6	439	389	277	172	178	105	331	972	2,340	2,330	1,760	216
7	383	385	224	188	177	106	351	1,300	2,040	2,280	1,470	268
8	354	384	228	197	177	116	373	1,520	1,660	2,240	1,060	308
9	357	380	255	202	144	116	373	1,520	1,600	2,240	858	308
10	363	379	275	236	125	126	372	1,570	1,720	2,260	795	308
11	389	377	282	269	124	148	373	1,830	1,930	2,250	771	308
12	406	396	282	301	121	149	425	2,080	2,170	2,250	723	303
13	411	411	304	326	120	152	539	2,220	2,450	2,200	688	245
14	411	410	334	335	119	152	635	2,270	2,550	2,210	582	216
15	448	406	336	335	121	159	779	2,330	2,680	2,210	439	195
16	468	403	335	335	121	196	852	2,360	2,790	2,240	257	184
17	468	400	334	335	121	209	850	2,460	2,930	2,260	204	183
18	468	400	330	335	131	215	846	2,550	2,910	2,260	198	183
19	469	398	330	331	137	243	766	2,600	2,770	2,260	196	185
20	515	398	326	318	137	287	640	2,590	2,680	2,260	192	204
21	540	392	329	279	137	313	601	2,570	2,590	2,240	188	274
22	561	393	324	253	137	313	604	2,530	2,470	2,220	196	324
23	572	408	324	253	137	311	657	2,390	2,400	2,190	207	322
24	572	390	324	254	140	308	748	2,390	2,350	2,160	251	319
25	571	386	322	258	139	308	779	2,440	2,550	2,150	323	318
26	566	380	322	258	139	309	805	2,520	2,660	2,170	371	319
27	512	379	306	258	141	309	816	2,690	2,660	2,190	367	319
28	411	375	300	258	140	302	813	2,900	2,610	2,170	362	319
29	411	367	307	260	---	285	810	2,980	2,490	2,150	326	319
30	406	363	e270	262	---	286	809	2,910	2,390	2,120	308	306
31	404	---	e265	250	---	288	---	2,850	---	2,110	291	---
Total	14,097	11,725	9,551	8,391	4,091	6,380	17,426	63,012	74,170	69,750	23,533	7,622
Mean	455	391	308	271	146	206	581	2,033	2,472	2,250	759	254
Max	572	411	363	335	204	313	852	2,980	2,930	2,480	2,090	324
Min	354	363	224	172	119	103	288	691	1,600	2,110	188	157
Ac-ft	27,960	23,260	18,940	16,640	8,110	12,650	34,560	125,000	147,100	138,300	46,680	15,120

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1943 - 2011, BY WATER YEAR (WY)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Mean	499	468	448	466	551	608	735	1,129	1,141	806	627	553
Max	1,430	1,551	1,404	1,190	1,214	1,918	2,475	2,870	3,165	2,598	2,570	2,279
(WY)	(1949)	(1949)	(1949)	(1949)	(1997)	(1983)	(1983)	(1983)	(1997)	(1997)	(1997)	(1997)
Min	179	148	146	162	140	74.1	115	180	111	126	150	81.7
(WY)	(1989)	(1971)	(2007)	(1968)	(2010)	(1977)	(1968)	(1992)	(1992)	(1947)	(1963)	(1944)

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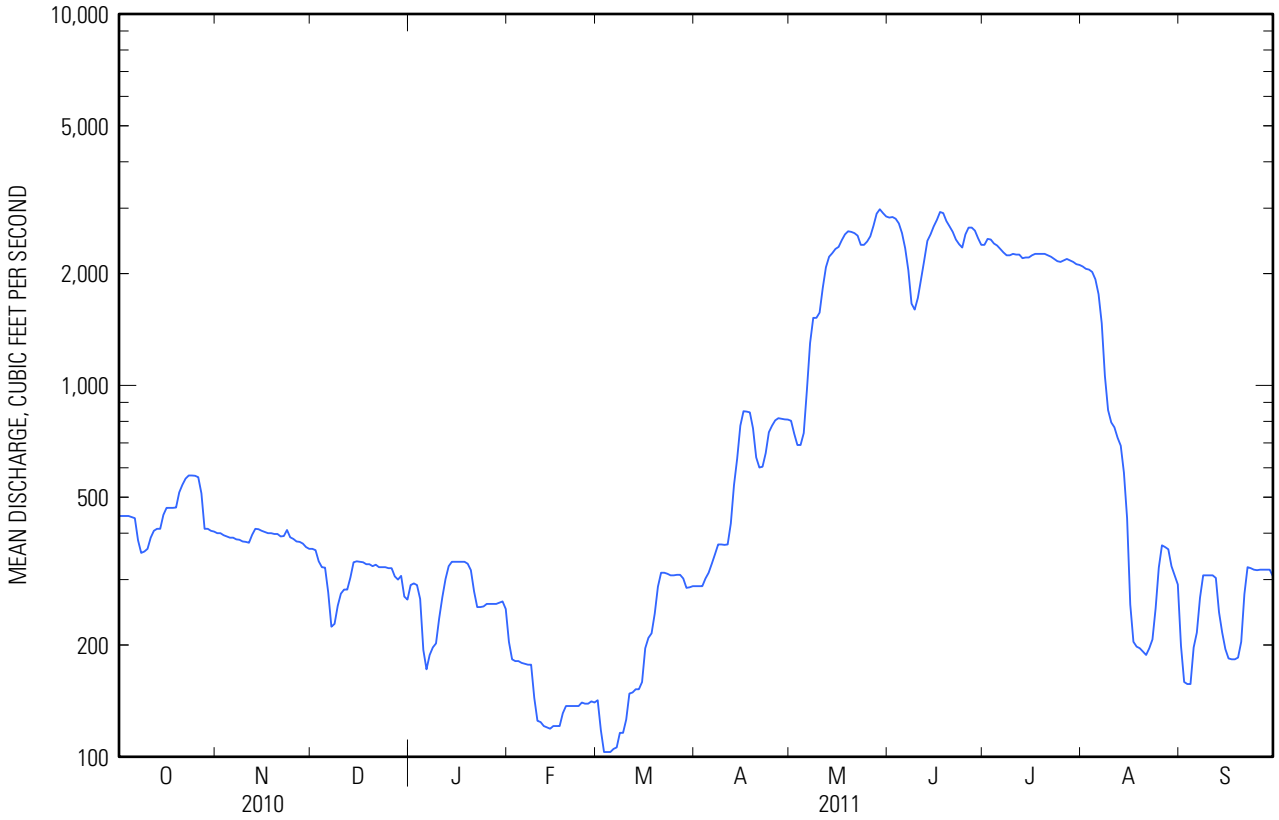
SUMMARY STATISTICS

	Calendar Year 2010		Water Year 2011		Water Years 1943 - 2011	
Annual total	147,123		309,748			
Annual mean	403		849		669	
Highest annual mean					1,691	1997
Lowest annual mean					213	1988
Highest daily mean	1,890	Jun 26	2,980	May 29	3,680	Jun 14, 1972
Lowest daily mean	116	Feb 20	103	Mar 3	-2,270	May 29, 1948
Annual seven-day minimum	117	Feb 20	107	Mar 3	-1,080	May 24, 1948
Annual runoff (ac-ft)	291,800		614,400		485,000	
10 percent exceeds	739		2,400		1,470	
50 percent exceeds	354		373		478	
90 percent exceeds	136		158		191	



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WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: April 1986 to September 1987 (at base gage), March 2005 to July 2007 (at auxiliary gage), July 2007 to current year (at base gage).

INSTRUMENTATION.--Water temperature recorder with 15-minute logging interval since March, 2005.

REMARKS.--Temperature records excellent except for June 5 - Aug. 18 which are good.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: Maximum, 30.1°C, July 23, 2006; minimum, 0.0°C, occurs during most winters.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURE: Maximum, 25.5°C, Aug. 27, 28; minimum, 0.2°C, Dec. 30.

TEMPERATURE, WATER, DEGREES CELSIUS
WATER YEAR OCTOBER 2010 TO SEPTEMBER 2011

Day	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
		October			November			December			January	
1	18.5	17.2	18.0	12.5	12.0	12.3	3.2	2.7	3.0	0.7	0.4	0.5
2	18.8	17.5	18.2	12.5	11.7	12.1	3.1	2.7	2.9	0.9	0.4	0.7
3	18.8	17.9	18.3	12.3	11.3	11.8	2.9	2.5	2.7	0.9	0.6	0.8
4	18.3	17.5	17.9	11.8	11.0	11.5	2.9	2.3	2.7	1.0	0.7	0.9
5	17.6	16.4	17.1	11.7	11.1	11.4	2.6	1.8	2.3	1.0	0.7	0.8
6	17.5	16.4	17.0	11.7	11.4	11.6	2.5	2.0	2.2	1.2	0.7	1.0
7	17.3	16.2	16.9	11.8	11.4	11.6	2.4	2.0	2.2	1.2	1.0	1.1
8	17.1	16.2	16.7	11.4	10.7	11.0	2.7	2.1	2.4	1.2	0.8	1.0
9	16.9	16.1	16.3	11.1	10.5	10.7	2.7	2.4	2.6	0.9	0.4	0.7
10	16.5	15.9	16.2	10.9	10.4	10.7	2.8	2.5	2.6	0.8	0.4	0.6
11	16.1	14.9	15.6	10.7	9.7	10.0	2.7	2.1	2.5	0.9	0.4	0.7
12	15.8	15.0	15.3	10.2	9.7	9.9	2.7	2.0	2.3	0.9	0.4	0.6
13	15.5	14.8	15.2	9.9	9.5	9.7	2.8	2.4	2.6	1.0	0.6	0.8
14	15.3	14.2	14.8	9.9	9.5	9.7	2.9	2.4	2.6	1.3	0.7	1.0
15	15.1	14.3	14.7	9.8	9.4	9.6	2.6	2.0	2.3	1.3	0.7	1.0
16	14.7	13.8	14.3	9.8	9.2	9.6	2.5	2.0	2.2	1.5	1.0	1.2
17	14.5	13.5	14.1	9.6	9.2	9.4	2.4	2.0	2.2	1.5	0.9	1.2
18	14.3	13.6	13.9	9.5	8.1	9.0	2.1	1.5	1.8	1.3	0.8	1.1
19	14.1	13.1	13.7	8.1	6.8	7.4	2.1	1.5	1.8	1.3	0.6	0.9
20	14.2	13.0	13.6	6.9	5.1	6.1	1.8	1.4	1.6	1.4	0.9	1.1
21	14.3	13.3	13.8	5.2	4.0	4.8	1.9	1.5	1.7	1.3	0.8	1.0
22	14.2	13.5	13.9	4.1	2.5	3.3	1.7	1.5	1.6	1.5	0.6	1.1
23	13.8	13.2	13.5	2.6	1.2	1.6	2.1	1.5	1.8	1.7	1.0	1.4
24	13.7	13.2	13.5	2.9	1.7	2.4	2.4	1.7	2.0	1.7	1.2	1.5
25	13.3	12.8	13.1	3.1	2.6	2.9	2.4	1.9	2.2	1.7	1.4	1.6
26	13.1	12.5	12.9	3.1	2.6	2.8	2.2	1.9	2.0	1.7	1.4	1.6
27	13.0	12.6	12.8	3.4	2.9	3.1	2.0	1.5	1.7	1.7	1.4	1.5
28	12.9	12.4	12.5	3.2	2.7	3.0	2.1	1.7	1.9	1.8	1.2	1.5
29	12.7	12.2	12.5	2.8	2.3	2.5	2.0	1.1	1.6	1.8	1.3	1.6
30	12.6	12.1	12.4	3.0	2.4	2.7	1.2	0.2	0.5	1.4	0.4	0.9
31	12.7	12.0	12.4	---	---	---	1.0	0.4	0.6	1.5	0.5	1.1
Month	18.8	12.0	14.9	12.5	1.2	7.8	3.2	0.2	2.1	1.8	0.4	1.0

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TEMPERATURE, WATER, DEGREES CELSIUS
WATER YEAR OCTOBER 2010 TO SEPTEMBER 2011

Day	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
		February			March			April			May	
1	1.6	0.8	1.2	3.4	2.8	3.1	8.1	7.5	7.8	12.0	9.5	10.6
2	1.9	1.3	1.6	3.9	3.1	3.5	7.7	6.7	7.2	10.3	9.2	9.6
3	1.9	1.3	1.6	4.6	3.0	3.7	7.8	6.8	7.3	11.2	8.8	9.9
4	2.1	1.5	1.8	4.7	3.3	3.9	7.8	6.8	7.2	11.9	9.7	10.7
5	2.5	1.6	2.0	5.1	3.7	4.3	7.9	6.5	7.2	11.8	9.5	10.5
6	2.4	1.8	2.1	5.9	4.0	4.8	7.9	6.7	7.1	12.5	10.8	11.6
7	2.5	1.8	2.1	6.4	4.5	5.3	7.2	6.2	6.7	11.7	10.4	11.0
8	2.1	1.4	1.7	5.5	4.6	5.0	8.6	6.3	7.3	12.6	10.6	11.5
9	2.0	1.0	1.5	4.9	4.2	4.6	9.2	8.2	8.7	13.6	11.3	12.3
10	2.6	1.5	1.9	5.5	4.1	4.8	9.2	8.2	8.7	14.3	12.0	12.9
11	2.6	1.8	2.2	5.2	4.5	4.9	8.5	7.1	7.9	12.6	10.7	11.8
12	2.9	1.9	2.4	5.6	4.5	5.1	8.7	7.0	7.9	12.7	10.3	11.5
13	3.1	2.2	2.5	5.6	4.9	5.3	8.3	7.0	7.6	13.2	11.3	12.2
14	3.1	2.4	2.8	5.9	4.8	5.3	8.3	6.9	7.6	13.7	12.6	13.1
15	3.0	2.5	2.8	5.8	4.8	5.4	8.7	6.9	7.6	13.6	12.7	13.2
16	3.5	2.4	2.8	5.6	4.5	5.0	8.5	7.2	7.8	12.7	11.5	12.4
17	3.5	2.6	2.9	5.8	4.9	5.4	8.9	7.2	8.0	12.5	11.3	11.9
18	3.6	2.7	3.1	5.8	4.9	5.2	9.3	7.5	8.3	14.2	11.9	12.9
19	3.1	1.6	2.4	5.8	4.9	5.3	9.7	7.6	8.6	15.4	13.4	14.3
20	2.4	1.2	1.8	6.0	5.0	5.4	9.3	8.1	8.7	15.7	14.0	14.8
21	3.2	2.0	2.6	6.2	5.4	5.8	8.9	7.7	8.3	15.3	13.2	14.5
22	3.9	2.9	3.3	6.9	6.0	6.4	10.3	7.6	8.9	15.3	13.3	14.3
23	3.3	1.8	2.7	6.9	5.2	5.9	10.3	8.6	9.7	16.2	14.6	15.3
24	1.8	0.7	1.3	6.0	5.0	5.3	10.4	7.8	9.0	16.3	15.2	15.8
25	1.1	0.4	0.7	5.8	5.1	5.5	9.5	8.1	8.8	15.4	14.0	14.7
26	2.0	0.7	1.4	6.4	5.3	5.8	10.1	8.1	9.0	15.2	14.8	15.0
27	2.5	1.8	2.2	6.7	5.9	6.3	10.5	8.8	9.7	14.9	13.8	14.4
28	3.4	2.3	2.8	7.2	5.7	6.5	9.9	8.2	9.0	15.5	14.0	14.7
29	---	---	---	7.5	5.9	6.8	9.8	8.5	9.1	16.2	15.0	15.6
30	---	---	---	7.4	6.3	6.9	11.3	8.7	9.9	16.4	14.7	15.7
31	---	---	---	8.1	6.9	7.4	---	---	---	15.1	13.9	14.5
Month	3.9	0.4	2.1	8.1	2.8	5.3	11.3	6.2	8.2	16.4	8.8	13.0

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TEMPERATURE, WATER, DEGREES CELSIUS
WATER YEAR OCTOBER 2010 TO SEPTEMBER 2011

Day	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
		June			July			August			September	
1	16.1	14.7	15.2	20.0	18.6	19.2	22.8	20.6	21.6	22.0	20.9	21.5
2	16.3	15.0	15.6	19.5	18.2	18.9	22.9	21.8	22.4	22.2	20.4	21.2
3	16.5	14.9	15.7	20.2	18.1	18.9	23.9	21.8	22.8	22.0	19.9	20.9
4	15.0	14.1	14.6	21.0	19.3	20.0	24.3	22.6	23.4	22.2	19.7	20.9
5	16.8	14.1	15.3	21.4	19.7	20.5	24.3	22.5	23.4	22.2	20.1	21.2
6	18.3	15.7	16.9	21.6	20.2	20.8	24.6	23.0	23.8	22.9	21.0	21.9
7	17.8	17.1	17.4	21.9	19.5	20.9	24.7	22.8	23.7	22.8	21.5	22.2
8	17.3	16.1	16.8	20.9	19.3	20.0	24.8	23.1	23.9	22.8	21.6	22.3
9	16.2	14.9	15.5	21.4	19.8	20.6	24.6	22.7	23.5	23.4	21.9	22.7
10	16.4	15.2	15.8	21.3	20.2	20.7	24.0	22.1	22.9	23.7	22.2	23.1
11	17.4	15.7	16.5	21.3	20.1	20.6	24.7	22.2	23.4	23.7	22.4	23.2
12	17.7	15.9	17.0	21.1	20.1	20.5	24.9	23.1	24.1	24.0	22.7	23.4
13	17.6	15.8	16.6	21.0	19.2	20.4	24.4	22.0	23.1	23.7	22.5	23.1
14	18.2	16.9	17.4	20.6	19.1	19.9	23.9	22.2	23.1	23.5	22.1	22.7
15	17.4	16.8	17.1	20.5	19.8	20.1	23.9	21.9	22.9	23.0	21.1	22.2
16	17.1	16.6	16.8	20.6	19.8	20.2	23.6	22.3	23.0	21.2	19.9	20.6
17	17.0	16.5	16.7	21.2	20.0	20.5	23.7	22.3	22.9	20.4	19.0	19.7
18	17.1	16.5	16.8	22.0	20.8	21.3	23.7	22.3	22.9	20.0	19.0	19.3
19	17.4	15.9	16.5	21.5	20.7	21.0	23.7	22.0	22.8	19.1	18.0	18.7
20	18.5	17.1	17.6	21.4	20.3	20.8	24.2	22.4	23.2	19.3	17.6	18.3
21	18.8	16.9	17.6	21.1	19.6	20.4	24.1	22.7	23.4	18.8	18.2	18.5
22	18.5	17.1	17.7	21.0	19.5	20.2	23.4	22.3	22.9	18.7	18.0	18.3
23	18.3	17.0	17.6	22.0	20.2	20.9	23.7	22.0	22.7	19.7	18.1	18.9
24	18.4	17.5	17.9	22.2	20.4	21.2	24.2	22.8	23.4	19.6	18.1	19.0
25	18.2	17.2	17.7	21.1	20.6	20.8	24.8	23.1	23.9	19.5	17.7	18.6
26	19.1	17.5	18.1	21.4	20.4	20.9	25.4	23.9	24.7	17.7	16.6	17.0
27	18.2	17.2	17.7	22.5	20.7	21.5	25.5	24.2	24.9	18.1	16.8	17.4
28	20.1	17.6	18.7	23.0	21.2	22.0	25.5	24.2	24.9	17.8	16.4	17.2
29	19.8	17.5	19.0	23.3	21.4	22.3	25.4	24.3	24.9	17.7	16.5	17.3
30	19.6	17.8	18.7	23.5	21.0	22.5	25.1	23.2	24.1	17.6	16.1	16.9
31	---	---	---	22.7	20.7	21.4	23.3	21.6	22.4	---	---	---
Month	20.1	14.1	16.9	23.5	18.1	20.6	25.5	20.6	23.4	24.0	16.1	20.3

	Max	Min	Mean
Year	25.5	0.2	11.4