

**CLIMATIC DATA FOR WILLIAMS LAKE,
HUBBARD COUNTY, MINNESOTA,
1987-88**

By R.S. Parkhurst, D.A. Merk, D.O. Rosenberry, and T.C. Winter

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CONVERSION FACTORS

Multiply	By	To Obtain
meter	3.281	feet
kilopascal	0.0099	standard atmosphere
mile per hour	1.609	kilometer per hour

To convert degrees Celsius (°C) to degrees Fahrenheit (°F) use the following formula:

$$^{\circ}\text{F} = 9/5(^{\circ}\text{C}) + 32$$

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ABSTRACT

Research on the hydrology of Williams Lake, north-central Minnesota, includes the study of evaporation. Presented here are those climatic data needed for mass-transfer studies, including: air temperatures, wind speed, humidity, and precipitation. Some calculated values necessary for this study, such as vapor pressure and vapor pressure deficit, are presented also. Data were collected at raft and land stations.

INTRODUCTION

Climatic data are being collected at Williams Lake, Hubbard County, Minnesota (fig.1), as part of a continuing study by the U.S. Geological Survey of the hydrology of the lake. Williams Lake is one of several lakes in different parts of the United States that have been selected for intensive study of hydrological, and related chemical and biological processes. The rationale for selection of Williams Lake is given by Siegel and Winter (1980). Climatic data from the 1982 and 1986 season are presented in Rosenberry and others (1988a, 1988b). Data collected in 1983, 1984, and 1985 are presented in Sturrock and others (1984, 1986a, and 1986b). Because data from these reports were used for energy-budget studies, they contain additional data, such as long and short wave radiation, temperature of the lake surface, dry-bulb and wet-bulb temperature, and Bowen ratio numbers. Climatic data collected in 1987 and 1988 were used for mass-transfer studies.

DATA COLLECTION AND PRESENTATION

Data presented here are being collected principally for studies of evaporation. Therefore, the period of record includes only the time when the lake is ice-free. The period of record for 1987 is from April 28 (Julian day 118) to October 31 (Julian day 304). The period of record for 1988 is from April 25 (Julian day 116) to November

(Julian day 312). Precipitation data from National Weather Service sites (fig. 1) are used in conjunction with precipitation data collected at the site and are collected throughout the entire year.

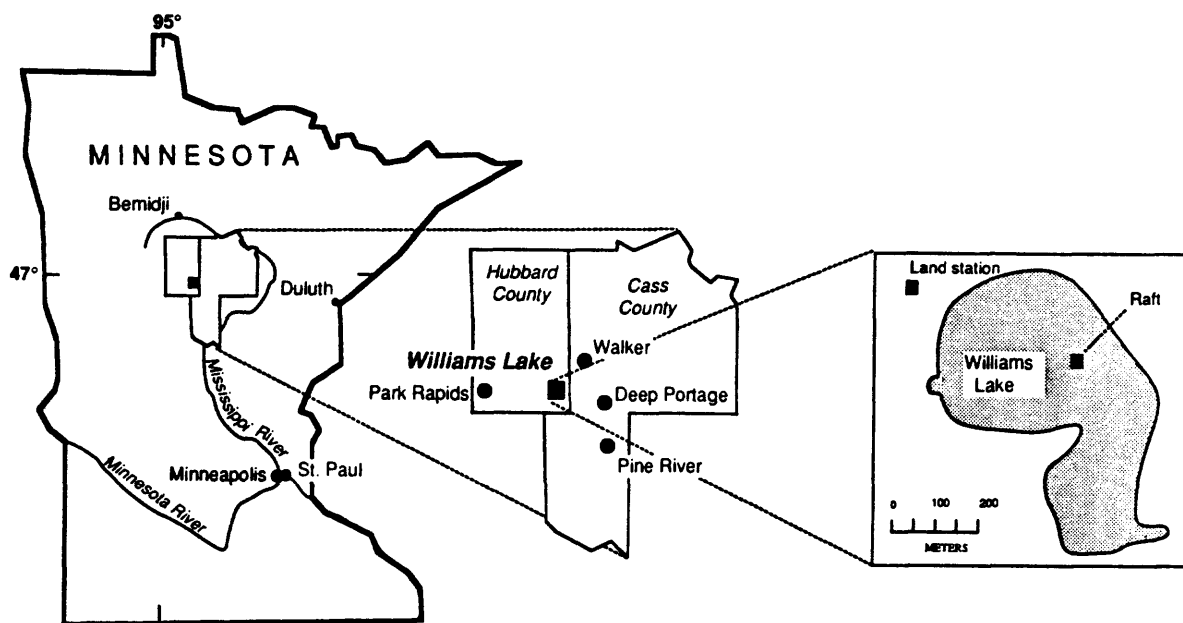


Figure 1. Locations of Williams Lake, National Weather Service precipitation sites, and instrument stations .

Climatological instruments are located on a raft in the middle of the lake, and at a land station located near the northwest shore of the lake (fig. 1). Instruments on the raft include anemometers at 1 and 2 meters above the water surface and an air temperature and humidity probe located 2 meters above the lake surface. Data from these sensors are recorded by a digital data logger located on the raft. The data logger scans the sensors every minute and calculates hourly and daily averages. In addition, for selected sensors, the daily output includes maximum and minimum values and the minute they occur.

The land station, located in a field 135 meters northwest of the lake, consists of a tipping-bucket rain gage and an analog hygrothermograph. The tipping-bucket rain gage is connected to an event recorder. The analog hygrothermograph measures air temperature and humidity, which are used as backup data. Both the event recorder and the hygrothermograph record the data on paper charts. Calibration checks are made with independent laboratory thermometers and an Assman psychrometer every few days.

Data presented here are daily summaries. Raft-station data together with land-station precipitation are considered primary. When the primary instruments were not operating properly, daily values were obtained by regression using data from backup instruments, if a satisfactory statistical relation could be established. Data used to establish regressions were selected so that they bracketed the period of missing or inadequate data. The values obtained by regression are noted in the tables.

Although only daily values are reported here, hourly values also were recorded. Hourly values are available for all or part of the period of record on request.

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Table 1.--Air temperature, vapor pressure, and humidity from the raft station at Williams Lake, 1987-88

[Temperatures are in degrees Celsius; vapor pressure and vapor pressure deficit are in kilopascals; --, missing or no data]

Date	Julian day	Average daily air temperature	Maximum daily air temperature	Time of maximum temperature	Minimum daily air temperature	Time of minimum temperature	Daily average vapor pressure	Daily average vapor pressure deficit	Daily average humidity, in percent
4/30/87	120	7.1	11.8	1253	3.3	0231	0.73	0.28	74
5/1/87	121	10.8	16.6	1400	5.8	0113	1.02	0.30	79
5/2/87	122	11.6	18.6	1612	4.1	0540	0.72	0.70	55
5/3/87	123	11.3	18.5	1742	4.4	0436	0.40	0.99	31
5/4/87	124	11.2	20.9	1754	0.9	0439	0.60	0.83	49
5/5/87	125	15.4	22.2	1802	6.8	0039	0.95	0.98	51
5/6/87	126	14.5	19.1	1502	9.8	2400	0.86	0.82	55
5/7/87	127	14.2	22.2	1726	5.8	0506	0.87	0.84	60
5/8/87	128	17.3	26.8	1732	3.8	0446	0.86	1.34	51
5/9/87	129	18.3	24.6	1454	12.1	0528	0.92	1.24	47
5/10/87	130	18.1	28.2	1536	10.7	0133	1.16	1.01	56
5/11/87	131	12.3	19.2	0017	5.0	2400	0.84	0.63	60
5/12/87	132	15.0	23.5	1637	3.8	0311	0.85	0.98	55
5/13/87	133	16.9	21.9	1842	11.8	1024	1.39	0.55	73
5/14/87	134	14.6	21.9	1842	7.4	2357	0.94	0.77	60
5/15/87	135	18.0	28.4	1721	6.2	0323	1.18	1.08	62
5/16/87	136	22.1	30.8	1632	13.8	2400	1.63	1.14	62
5/17/87	137	11.6	13.8	0002	9.3	2348	1.29	0.08	94
5/18/87	138	6.6	9.4	0030	5.0	2353	0.92	0.06	94
5/19/87	139	9.5	14.1	1445	4.7	0447	1.10	0.12	91
5/20/87	140	12.5	14.8	2338	10.6	0859	1.37	0.08	95
5/21/87	141	9.7	14.4	0005	3.4	2400	1.16	0.07	95
5/22/87	142	4.6	8.0	1630	2.1	0459	0.79	0.07	93
5/23/87	143	9.7	18.2	1909	2.4	0439	1.01	0.25	83
5/24/87	144	14.3	19.0	1543	9.3	0451	1.24	0.43	77
5/25/87	145	11.3	12.0	1751	10.3	1308	1.23	0.10	92
5/26/87	146	15.3	23.1	1806	10.7	0156	1.56	0.23	89
5/27/87	147	20.2	24.5	1814	16.6	0132	1.96	0.43	84
5/28/87	148	21.4	26.6	1827	17.7	0512	1.99	0.60	79
5/29/87	149	18.8	23.5	1314	15.2	2400	1.89	0.31	87
5/30/87	150	17.7	23.1	1239	14.2	2351	1.79	0.26	88
5/31/87	151	21.2	28.3	1857	12.9	0350	1.67	0.97	69
6/1/87	152	19.9	23.4	0844	14.7	2400	1.73	0.61	74
6/2/87	153	15.7	20.3	1316	10.6	0434	1.08	0.72	62
6/3/87	154	11.3	16.4	1850	7.8	0502	0.89	0.46	68
6/4/87	155	16.3	23.6	1522	7.8	0412	1.13	0.83	63
6/5/87	156	17.1	25.5	1818	9.0	0456	1.26	0.78	67
6/6/87	157	21.4	30.4	1736	14.4	0459	1.90	0.75	75
6/7/87	158	21.7	27.6	1116	16.0	0513	1.95	0.71	76

Table 1.--Air temperature, vapor pressure, and humidity from the raft station at Williams Lake, 1987-88 --Continued

Date	Julian day	Average daily air temperature	Maximum daily air temperature	Time of maximum temperature	Minimum daily air temperature	Time of minimum temperature	Daily average vapor pressure	Daily average vapor pressure deficit	Daily average humidity, in percent
6/8/87	159	14.0	17.7	0023	7.7	2349	1.35	0.26	84
6/9/87	160	14.2	22.2	1842	5.3	0433	1.06	0.65	69
6/10/87	161	13.1	14.6	0752	11.4	0145	1.32	0.19	88
6/11/87	162	20.8	28.4	1538	13.0	0002	1.63	0.94	70
6/12/87	163	21.2	28.8	1858	13.4	0446	1.66	0.96	69
6/13/87	164	24.4	33.0	1856	16.2	0246	1.75	1.48	62
6/14/87	165	21.9	27.0	1533	14.6	2400	1.47	1.24	60
6/15/87	166	21.5	29.7	1849	12.2	0452	1.54	1.17	64
6/16/87	167	23.6	30.0	1832	14.1	0444	1.67	1.37	61
6/17/87	168	23.9	28.7	1700	19.2	0613	2.20	0.78	74
6/18/87	169	22.9	28.0	1847	17.9	2306	1.91	0.93	71
6/19/87	170	22.4	28.4	1839	14.7	0436	1.71	1.08	65
6/20/87	171	22.0	26.8	1820	16.5	0445	1.87	0.82	70
6/21/87	172	21.9	28.1	1744	15.7	0333	2.09	0.60	79
6/22/87	173	25.0	31.1	1812	19.1	0429	2.33	0.90	75
6/23/87	174	22.1	25.3	1823	16.4	2359	2.06	0.62	78
6/24/87	175	19.7	26.0	1246	14.9	2400	1.68	0.66	75
6/25/87	176	16.7	19.8	1019	13.4	2400	1.40	0.52	75
6/26/87	177	14.6	18.4	1819	9.9	2400	1.19	0.49	73
6/27/87	178	17.0	24.9	1854	9.1	0357	1.31	0.72	70
6/28/87	179	19.0	23.1	1318	13.1	0424	1.59	0.63	73
6/29/87	180	17.3	21.7	1819	12.0	2400	1.36	0.65	71
6/30/87	181	16.8	24.0	1853	9.7	0511	1.21	0.78	67
7/1/87	182	17.5	22.6	1320	12.9	0155	1.62	0.41	81
7/2/87	183	18.1	21.6	1517	14.0	2400	1.68	0.42	81
7/3/87	184	18.0	26.3	1904	11.9	0434	1.45	0.68	73
7/4/87	185	20.0	26.1	1818	12.3	0345	1.64	0.78	72
7/5/87	186	18.2	21.3	1902	16.3	0400	1.84	0.26	88
7/6/87	187	21.3	28.2	1836	16.3	0546	2.05	0.55	81
7/7/87	188	22.2	28.0	1337	14.8	2400	2.07	0.66	78
7/8/87	189	20.5	25.1	1001	13.4	0455	1.73	0.74	73
7/9/87	190	22.7	28.6	1636	18.1	0558	1.83	0.98	68
7/10/87	191	23.7	30.6	1657	18.0	2400	2.13	0.83	74
7/11/87	192	20.8	26.1	1535	17.8	0155	2.07	0.41	84
7/12/87	193	16.6	19.1	0004	13.6	2400	1.62	0.28	85
7/13/87	194	15.3	20.3	1902	10.9	0453	1.28	0.49	75
7/14/87	195	15.5	20.4	1301	10.1	0435	1.43	0.37	81
7/15/87	196	19.9	25.7	1834	14.2	0340	1.66	0.71	73
7/16/87	197	24.6	31.4	1759	18.1	0533	2.01	1.18	66

Table 1.--Air temperature, vapor pressure, and humidity from the raft station at Williams Lake, 1987-88 --Continued

Date	Julian day	Average daily air temperature	Maximum daily air temperature	Time of maximum temperature	Minimum daily air temperature	Time of minimum temperature	Daily average vapor pressure	Daily average humidity, in percent
7/17/87	198	23.8	29.4	1546	19.2	2041	2.49	0.50
7/18/87	199	22.1	26.2	1601	19.1	2400	2.30	0.37
7/19/87	200	21.5	29.4	1859	17.0	2400	2.10	0.49
7/20/87	201	20.5	29.6	1830	15.8	0608	2.03	0.44
7/21/87	202	23.5	28.8	1542	17.9	0436	2.25	0.71
7/22/87	203	26.4	31.7	1446	21.0	0550	2.57	0.94
7/23/87	204	24.0	28.2	1344	20.2	2400	2.37	0.64
7/24/87	205	21.2	27.4	1850	16.5	2340	1.85	0.70
7/25/87	206	21.9	28.1	1452	16.3	0426	2.05	0.64
7/26/87	207	22.7	27.9	1648	17.7	0453	2.12	0.68
7/27/87	208	23.1	27.9	1743	19.7	0202	2.11	0.75
7/28/87	209	24.7	29.7	1512	20.9	0503	2.54	0.62
7/29/87	210	25.0	31.1	1659	20.3	0515	2.38	0.84
7/30/87	211	25.4	31.1	1600	20.5	0602	2.45	0.85
7/31/87	212	24.6	31.5	1729	19.8	0349	2.58	0.59
8/1/87	213	25.3	29.1	1858	22.2	2400	2.62	0.62
8/2/87	214	25.3	31.6	1708	19.5	0549	2.42	0.89
8/3/87	215	21.0	24.5	1420	15.8	2400	1.82	0.70
8/4/87	216	16.6	20.9	1806	14.0	2357	1.51	0.39
8/5/87	217	19.7	24.9	1541	13.2	0444	1.71	0.65
8/6/87	218	19.5	22.7	1803	15.5	2400	1.78	0.50
8/7/87	219	20.9	25.6	1431	15.5	2400	1.72	0.79
8/8/87	220	20.1	26.5	1312	13.6	0437	1.77	0.65
8/9/87	221	20.4	24.8	1820	15.2	2333	1.73	0.71
8/10/87	222	20.9	26.9	1727	13.5	0420	1.74	0.82
8/11/87	223	23.9	28.4	1335	19.1	0532	2.07	0.94
8/12/87	224	18.1	21.3	0057	11.6	2358	1.61	0.48
8/13/87	225	17.7	25.5	1607	10.0	0317	1.41	0.69
8/14/87	226	19.8	22.4	1033	17.0	0316	1.97	0.36
8/15/87	227	22.1	29.9	1400	17.5	0551	2.20	0.53
8/16/87	228	18.7	21.7	1631	15.1	2358	1.80	0.37
8/17/87	229	16.8	22.6	1754	13.7	0347	1.51	0.43
8/18/87	230	16.2	20.8	1532	12.4	2240	1.45	0.42
8/19/87	231	16.4	22.6	1838	10.2	0514	1.25	0.68
8/20/87	232	18.9	26.1	1824	12.5	0036	1.76	0.47
8/21/87	233	19.4	24.0	1458	13.5	2400	1.80	0.48
8/22/87	234	13.8	17.7	1414	8.9	2344	1.14	0.46
8/23/87	235	11.9	18.1	1845	6.9	0509	1.02	0.41
8/24/87	236	15.7	22.1	1347	7.8	0157	1.26	0.60

Table 1.--Air temperature, vapor pressure, and humidity from the raft station at Williams Lake, 1987-88 --Continued

Date	Julian day	Average daily air temperature	Maximum daily air temperature	Time of maximum temperature	Minimum daily air temperature	Time of minimum temperature	Daily average vapor pressure	Daily average vapor pressure deficit	Daily average humidity, in percent
8/25/87	237	14.8	18.6	1302	12.7	2347	1.44	0.26	85
8/26/87	238	14.3	16.0	1139	12.5	0256	1.40	0.22	86
8/27/87	239	16.3	22.0	1558	12.2	0601	1.42	0.46	78
8/28/87	240	16.6	22.8	1820	9.9	0603	1.39	0.56	75
8/29/87	241	18.6	25.5	1648	12.5	0545	1.62	0.60	75
8/30/87	242	14.1	17.3	1503	9.5	2400	1.17	0.45	73
8/31/87	243	12.0	17.8	1723	6.0	0436	1.00	0.44	73
9/1/87	244	14.9	18.8	1347	9.9	2400	1.27	0.45	75
9/2/87	245	15.2	22.3	1707	7.7	0531	1.17	0.63	70
9/3/87	246	17.6	23.2	1551	13.0	0347	1.46	0.59	72
9/4/87	247	17.7	21.0	1741	14.8	2400	1.63	0.40	80
9/5/87	248	15.4	17.1	1046	13.7	2150	1.51	0.24	86
9/6/87	249	16.7	23.1	1752	12.1	0643	1.44	0.49	77
9/7/87	250	15.1	18.8	1404	10.2	2352	1.43	0.30	83
9/8/87	251	14.9	21.2	1736	9.8	0636	1.15	0.59	70
9/9/87	252	16.0	21.5	1715	11.2	0551	1.29	0.58	71
9/10/87	253	14.1	18.2	1408	10.2	2400	1.33	0.28	83
9/11/87	254	11.8	15.8	1355	7.9	0600	1.11	0.29	81
9/12/87	255	9.6	13.5	1709	6.0	0637	1.03	0.17	86
9/13/87	256	11.2	17.6	1754	5.3	0612	1.03	0.35	78
9/14/87	257	15.0	23.1	1652	7.6	0215	1.20	0.59	72
9/15/87	258	17.4	25.9	1724	10.4	0602	1.54	0.54	78
9/16/87	259	18.2	22.9	1414	13.3	0448	1.66	0.47	79
9/17/87	260	16.0	18.6	1529	14.1	0743	1.47	0.35	81
9/18/87	261	12.1	14.7	0001	10.6	2105	1.22	0.19	87
9/19/87	262	10.7	11.8	2018	9.7	1208	1.13	0.16	88
9/20/87	263	12.9	16.5	1552	10.6	0454	1.24	0.25	84
9/21/87	264	13.5	16.4	1550	9.0	2400	1.25	0.31	81
9/22/87	265	14.0	19.9	1604	8.1	0407	1.16	0.50	73
9/23/87	266	15.7	23.9	1504	8.4	2357	1.14	0.72	66
9/24/87	267	10.1	17.2	1712	5.3	2400	0.91	0.37	75
9/25/87	268	12.2	22.7	1709	3.5	0525	1.03	0.49	73
9/26/87	269	17.0	24.1	1630	10.7	0608	1.47	0.54	75
9/27/87	270	21.1							75
9/28/87	271	14.8							80
9/29/87	272	14.7							54
9/30/87	273								
10/1/87	274								
10/2/87	275	4.1	9.0	1546	0.5	2400	0.52	0.31	65

Table 1---Air temperature, vapor pressure, and humidity from the raft station at Williams Lake, 1987-88 --Continued

Date	Julian day	Average daily air temperature	Maximum daily air temperature	Time of maximum temperature	Minimum daily air temperature	Time of minimum temperature	Daily average vapor pressure	Daily average vapor pressure deficit	Daily average humidity, in percent
10/3/87	276	8.9	17.3	1636	-0.2	0246	0.52	0.71	51
10/4/87	277	15.6	24.0	1502	7.2	0631	0.80	1.07	46
10/5/87	278	7.8	13.1	0001	4.6	2333	0.86	0.21	82
10/6/87	279	4.0	6.7	1702	0.9	2256	0.62	0.19	77
10/7/87	280	3.9	9.9	1558	-1.6	0628	0.58	0.24	74
10/8/87	281	7.8	13.8	1600	3.2	0441	0.63	0.46	60
10/9/87	282	0.7	5.8	0001	-0.4	2400	0.48	0.16	75
10/10/87	283	1.1	5.2	1554	-1.3	0653	0.40	0.26	62
10/11/87	284	3.8	12.2	1555	-3.4	0459	0.51	0.35	64
10/12/87	285	6.3	14.9	1620	-1.3	0646	0.59	0.43	66
10/13/87	286	11.4	18.9	1521	5.3	2400	0.61	0.78	47
10/14/87	287	6.7	11.4	1516	3.6	0456	0.60	0.39	62
10/15/87	288	6.7	7.1	2400	5.5	0026	0.75	0.23	76
10/16/87	289	5.9	7.2	0014	4.3	2335	0.80	0.13	87
10/17/87	290	6.6	12.9	1629	2.4	0811	0.76	0.24	78
10/18/87	291	4.6	9.2	1426	0.3	2234	0.57	0.29	69
10/19/87	292	3.4	8.6	1316	-0.2	0654	0.49	0.31	65
10/20/87	293	0.6	2.4	1522	-0.4	0226	0.53	0.11	82
10/21/87	294	0.4	4.3	0953	-3.9	0709	0.44	0.19	72
10/22/87	295	0.3	1.2	1308	-0.9	0014	0.53	0.09	85
10/23/87	296	0.7	2.6	1508	-0.2	0733	0.56	0.09	87
10/24/87	297	0.2	2.6	1542	-1.6	2255	0.53	0.09	86
10/25/87	298	2.6	5.6	2400	-2.0	0309	0.60	0.15	81
10/26/87	299	6.1	9.7	1455	1.7	2139	0.69	0.26	74
10/27/87	300	2.3	4.1	1327	-1.1	2400	0.54	0.18	75
10/28/87	301	2.5	8.2	1514	-1.4	0331	0.53	0.22	74
10/29/87	302	6.1	12.2	1543	1.4	0151	0.61	0.36	66
10/30/87	303	4.0	7.4	1408	1.2	0723	0.63	0.19	77
10/31/87	304	6.4	14.0	1539	1.8	0033	0.68	0.31	72
4/25/88	116	3.4	6.3	1755	0.4	0531	0.51	0.27	66
4/26/88	117	3.8	6.8	1800	-0.8	0243	0.52	0.29	67
4/27/88	118	6.5	12.7	1840	0.9	0533	0.46	0.54	51
4/28/88	119	9.2	19.2	1805	-1.0	0512	0.48	0.80	49
4/29/88	120	12.5	20.7	1806	0.2	0425	0.53	1.06	44
4/30/88	121	16.0	20.6	1258	11.1	0201	0.73	1.12	39
5/1/88	122	18.4	22.6	1439	13.6	0244	0.75	1.41	35
5/2/88	123	18.3	23.0	1547	13.6	0604	0.63	1.51	31
5/3/88	124	16.5	23.2	1743	10.3	2213	0.63	1.32	36
5/4/88	125	15.3	23.1	1706	5.1	0524	0.77	1.08	50

Table 1.--Air temperature, vapor pressure, and humidity from the raft station at Williams Lake, 1987-88 --Continued

Date	Julian day	Average daily air temperature	Maximum daily air temperature	Time of maximum temperature	Minimum daily air temperature	Time of minimum temperature	Daily average vapor pressure	Daily average humidity, in percent
5/5/88	126	15.0	22.6	1615	7.1	0548	0.90	55
5/6/88	127	16.9	25.5	1524	9.0	0530	0.82	46
5/7/88	128	16.1	22.9	1616	10.7	0312	1.17	66
5/8/88	129	16.0	20.8	1333	12.2	2203	1.30	73
5/9/88	130	12.2	18.7	1751	6.6	2400	1.03	75
5/10/88	131	11.7	18.4	1729	4.9	0508	0.72	58
5/11/88	132	14.9	20.8	1307	6.9	0001	0.87	52
5/12/88	133	11.9	21.9	1455	3.6	2354	1.09	77
5/13/88	134	7.4	16.6	1746	-0.5	0513	0.55	58
5/14/88	135	14.5	23.2	1752	6.0	0006	0.94	57
5/15/88	136	9.5	14.1	0749	5.8	2358	0.97	82
5/16/88	137	8.3	14.4	1724	4.1	2400	0.67	64
5/17/88	138	12.3	18.9	1809	4.0	0009	0.63	48
5/18/88	139	18.6	25.0	1647	10.5	0120	1.13	52
5/19/88	140	19.4	25.4	1535	14.6	2400	1.53	68
5/20/88	141	14.9	17.0	1548	13.3	0233	1.57	93
5/21/88	142	14.2	17.2	1307	11.8	2358	1.43	89
5/22/88	143	13.6	20.9	1756	8.9	2400	1.24	82
5/23/88	144	16.6	24.7	1523	6.2	0442	1.02	60
5/24/88	145	14.1	20.7	1823	5.6	0445	0.80	55
5/25/88	146	18.4	26.4	1710	8.4	0452	0.91	43
5/26/88	147	21.1	27.3	1627	14.4	0511	1.58	65
5/27/88	148	20.4	26.8	1403	13.9	0500	1.89	80
5/28/88	149	22.8	28.3	1450	17.5	0446	2.14	78
5/29/88	150	23.5	27.8	1732	18.4	0223	2.04	72
5/30/88	151	24.2	29.1	1758	19.4	0511	2.01	67
5/31/88	152	25.2	29.1	1804	20.9	0505	2.00	63
6/1/88	153	23.2	29.4	1808	18.5	0502	2.13	75
6/2/88	154	21.7	27.3	1436	17.2	0555	2.05	80
6/3/88	155	20.5	27.5	1833	13.0	0446	2.00	83
6/4/88	156	23.8	30.0	1720	17.1	0455	2.07	72
6/5/88	157	24.9	30.5	1421	18.7	0357	2.00	66
6/6/88	158	24.3	30.2	1816	17.4	0501	1.63	56
6/7/88	159	24.9	31.9	1621	15.1	0500	1.79	60
6/8/88	160	13.1	17.6	0001	8.3	2334	1.13	75
6/9/88	161	14.6	22.3	1827	5.4	0454	0.93	60
6/10/88	162	19.0	27.3	1811	8.5	0502	1.04	54
6/11/88	163	23.8	30.7	1704	15.8	0524	1.20	42
6/12/88	164	23.2	29.5	1509	19.1	0417	1.54	55

Table 1.--Air temperature, vapor pressure, and humidity from the raft station at Williams Lake, 1987-88 --Continued

Date	Julian day	Average daily air temperature	Maximum daily air temperature	Time of maximum temperature	Minimum daily air temperature	Time of minimum temperature	Daily average vapor pressure	Daily average humidity, in percent
6/13/88	165	22.0	26.1	1537	18.9	0445	2.21	84
6/14/88	166	19.1	24.1	1032	14.6	2400	1.95	87
6/15/88	167	16.4	22.0	1537	12.1	2400	1.46	80
6/16/88	168	15.4	20.7	1800	9.7	0508	1.40	81
6/17/88	169	20.0	26.9	1659	11.9	0340	1.72	75
6/18/88	170	23.8	30.7	1519	18.0	0555	2.24	77
6/19/88	171	25.3	32.0	1439	17.4	0455	1.93	65
6/20/88	172	23.7	29.9	1804	14.9	0441	1.62	59
6/21/88	173	22.8	29.7	1826	17.8	0538	2.26	82
6/22/88	174	21.4	24.3	1553	16.9	2400	1.46	59
6/23/88	175	19.2	23.1	1653	15.7	0323	1.73	78
6/24/88	176	24.7	31.1	1332	18.3	0342	2.39	77
6/25/88	177	19.8	25.6	0001	14.7	2359	1.60	70
6/26/88	178	18.6	23.6	1807	12.6	0449	1.57	75
6/27/88	179	22.0	28.4	1841	14.3	0215	1.71	67
6/28/88	180	17.5	23.1	0037	13.0	2354	1.65	81
6/29/88	181	15.7	21.1	1605	10.5	0504	0.84	47
6/30/88	182	16.5	22.6	1704	10.2	0503	0.98	53
7/1/88	183	16.1	21.0	1011	8.4	0345	1.24	70
7/2/88	184	20.6	27.4	1838	14.7	0506	1.47	64
7/3/88	185	22.9	29.2	1742	15.0	0153	1.63	61
7/4/88	186	25.9	32.8	1605	18.4	0505	2.28	68
7/5/88	187	29.8	34.5	1607	24.6	0550	2.33	57
7/6/88	188	26.5	36.0	1529	20.1	1931	2.27	71
7/7/88	189	24.7	29.5	0939	18.7	2356	2.25	71
7/8/88	190	22.6	28.4	1908	16.1	0453	1.82	70
7/9/88	191	22.5	29.6	1514	15.8	0452	2.04	76
7/10/88	192	17.2	19.5	1821	13.0	2400	1.51	77
7/11/88	193	16.6	21.9	1848	11.0	0328	1.47	79
7/12/88	194	19.9	25.5	1734	12.9	0510	1.52	68
7/13/88	195	22.0	28.1	1452	16.6	2400	1.77	70
7/14/88	196	21.7	27.5	1829	13.8	0518	1.63	66
7/15/88	197	24.3	29.8	1258	17.0	2400	2.07	68
7/16/88	198	20.8	28.8	1850	13.8	0513	1.59	68
7/17/88	199	21.0	25.8	1425	16.2	2400	1.47	63
7/18/88	200	20.1	26.2	1848	14.3	0402	1.53	68
7/19/88	201	20.3	27.7	1854	13.3	0437	1.52	67
7/20/88	202	18.4	23.8	1740	13.7	0331	1.64	79
7/21/88	203	20.6	27.1	1911	13.5	0527	1.65	71

Table 1.--Air temperature, vapor pressure, and humidity from the raft station at Williams Lake, 1987-88 --Continued

Date	Julian day	Average daily air temperature	Maximum daily air temperature	Time of maximum temperature	Minimum daily air temperature	Time of minimum temperature	Daily average vapor pressure	Daily average vapor pressure deficit	Daily average humidity, In percent
7/22/88	204	23.1	29.7	1736	14.8	0459	1.59	1.35	61
7/23/88	205	24.5	29.7	1727	19.2	0518	1.67	1.46	56
7/24/88	206	20.3	24.6	1605	14.5	2356	1.72	0.68	74
7/25/88	207	20.0	25.7	1832	12.6	0506	1.56	0.85	70
7/26/88	208	24.7	32.2	1800	19.2	0233	1.68	1.51	56
7/27/88	209	28.7	36.4	1831	20.1	0127	1.76	2.37	48
7/28/88	210	27.9	33.7	1827	21.8	0536	2.00	1.84	55
7/29/88	211	25.5	30.5	1635	17.9	2400	2.25	1.08	70
7/30/88	212	22.4	28.2	1838	15.3	0516	1.61	1.17	63
7/31/88	213	24.6	32.3	1329	18.2	0141	2.07	1.13	69
8/1/88	214	21.7	28.1	1201	17.4	2332	1.99	0.64	77
8/2/88	215	20.2	27.6	1808	17.2	0236	2.12	0.28	89
8/3/88	216	21.3	27.6	1324	17.8	0458	2.24	0.33	88
8/4/88	217	19.9	24.1	1424	16.5	2400	1.88	0.46	82
8/5/88	218	20.4	28.7	1851	15.6	0457	1.89	0.57	80
8/6/88	219	25.5	32.4	1555	16.8	0545	2.03	1.36	64
8/7/88	220	23.2	29.0	1142	17.4	2321	2.19	0.69	78
8/8/88	221	17.6	21.7	1835	14.1	0557	1.55	0.49	78
8/9/88	222	19.7	26.5	1811	12.0	0434	1.54	0.82	70
8/10/88	223	25.5	30.7	1628	19.7	0429	2.18	1.15	68
8/11/88	224	24.7	29.8	1732	19.3	0536	2.35	0.82	76
8/12/88	225	24.2	28.7	1422	19.2	0256	2.49	0.57	82
8/13/88	226	20.2	25.2	0312	17.5	1215	2.15	0.24	90
8/14/88	227	22.0	28.2	1811	18.4	2348	2.13	0.56	81
8/15/88	228	24.3	30.0	1748	17.5	0326	2.46	0.67	81
8/16/88	229	28.3	35.7	1628	22.1	0203	2.69	1.30	72
8/17/88	230	20.9	22.6	0001	18.5	2352	2.22	0.25	90
8/18/88	231	19.1	22.9	1820	14.2	2400	1.58	0.66	71
8/19/88	232	17.7	22.4	1702	11.6	0546	1.66	0.40	81
8/20/88	233	20.7	25.4	1524	16.6	0530	2.07	0.40	85
8/21/88	234	19.9	21.9	1947	17.2	0308	2.06	0.26	89
8/22/88	235	19.2	21.7	1507	14.3	2400	1.99	0.24	89
8/23/88	236	16.8	20.4	1719	13.3	0528	1.58	0.35	83
8/24/88	237	18.9	24.7	1600	13.7	0612	1.46	0.77	69
8/25/88	238	15.6	19.2	1746	11.8	2351	1.35	0.43	77
8/26/88	239	16.9	22.7	1413	10.3	0548	1.38	0.60	74
8/27/88	240	13.2	16.2	0040	10.0	2058	1.17	0.35	78
8/28/88	241	12.4	17.1	1816	8.4	0447	1.22	0.23	85
8/29/88	242	12.5	16.8	1822	7.9	0616	1.20	0.28	83

Table 1.-- Air temperature, vapor pressure, and humidity from the raft station at Williams Lake, 1987-88 --Continued

Date	Julian day	Average daily air temperature	Maximum daily air temperature	Time of maximum temperature	Minimum daily air temperature	Time of minimum temperature	Daily average vapor pressure	Daily average vapor pressure deficit	Daily average humidity, in percent
8/30/88	243	14.6	21.4	1742	6.7	0524	1.30	0.43	79
8/31/88	244	18.5	24.6	1614	12.5	0223	1.82	0.37	85
9/1/88	245	20.2	25.3	1805	14.8	2352	1.91	0.49	82
9/2/88	246	15.9	20.7	1237	13.4	0151	1.45	0.37	81
9/3/88	247	15.3	18.7	1732	13.1	0342	1.51	0.24	87
9/4/88	248	13.8	17.2	1439	7.2	2352	1.23	0.36	79
9/5/88	249	10.5	16.6	1759	7.1	2318	1.05	0.30	81
9/6/88	250	12.8	20.0	1732	5.0	0528	1.06	0.49	75
9/7/88	251	17.6	23.6	1621	10.3	0109	1.24	0.84	63
9/8/88	252	15.2	18.9	1423	10.8	0525	1.03	0.71	61
9/9/88	253	14.3	21.2	1547	7.0	2359	0.86	0.85	56
9/10/88	254	12.3	16.9	1547	5.9	0537	1.07	0.41	76
9/11/88	255	20.5	27.6	1516	15.4	0155	1.70	0.76	70
9/12/88	256	10.9	17.3	0001	6.0	2354	1.16	0.16	88
9/13/88	257	12.9	21.4	1426	4.0	0607	1.07	0.52	74
9/14/88	258	12.9	18.6	1346	5.3	0607	1.01	0.53	71
9/15/88	259	13.1	16.0	1305	10.5	0015	1.28	0.23	71
9/16/88	260								
9/17/88	261								
9/18/88	262	17.8					1.78		93
9/19/88	263	13.1					1.41		99
9/20/88	264	8.8					0.99		89
9/21/88	265	10.6					1.15		94
9/22/88	266	11.7					1.12		85
9/23/88	267	10.4					0.89		71
9/24/88	268	13.4					1.01		67
9/25/88	269	10.2					1.01		83
9/26/88	270	14.5					1.30		82
9/27/88	271	9.8					0.98		84
9/28/88	272	8.1					0.99		95
9/29/88	273	10.8					1.23		99
9/30/88	274								
10/1/88	275								
10/2/88	276	6.6					0.74		76
10/3/88	277	5.6					0.57		59
10/4/88	278	2.3					0.56		72
10/5/88	279	3.4					0.58		70
10/6/88	280	6.7					0.55		53
10/7/88	281	10.7					0.89		70

Table 1.--Air temperature, vapor pressure, and humidity from the raft station at Williams Lake, 1987-88 --Continued

Date	Julian day	Average daily air temperature	Maximum daily air temperature	Time of maximum temperature	Minimum daily air temperature	Time of minimum temperature	Daily average vapor pressure	Daily average vapor pressure deficit	Daily average humidity, in percent
10/8/88	282	7.7					0.87		84
10/9/88	283	11.8					0.84		61
10/10/88	284	9.5	13.7	0001	4.3	2400	0.66	0.53	56
10/11/88	285	3.1	7.5	1547	-0.8	2350	0.53	0.24	72
10/12/88	286	3.6	9.7	1549	-2.7	0616	0.54	0.28	71
10/13/88	287	10.3	17.5	1600	2.8	0644	0.67	0.65	54
10/14/88	288	14.2	24.3	1555	6.4	0702	1.03	0.70	66
10/15/88	289	15.4	21.5	1341	10.1	0642	1.20	0.59	70
10/16/88	290	10.0	13.8	0108	3.2	2400	0.92	0.32	76
10/17/88	291	4.8	8.1	1526	0.7	2255	0.69	0.17	81
10/18/88	292	3.5	7.4	1531	0.8	0004	0.69	0.10	88
10/19/88	293	4.0	10.4	1425	-0.7	0658	0.61	0.23	78
10/20/88	294	3.6	5.5	1935	0.6	0002	0.71	0.08	90
10/21/88	295	3.9	7.1	1457	-1.4	2400	0.64	0.18	80
10/22/88	296	4.1	9.1	1536	-2.4	0342	0.59	0.26	74
10/23/88	297	0.9	6.4	0002	-1.7	2359	0.58	0.08	87
10/24/88	298	-1.7	0.5	1443	-3.4	0813	0.43	0.11	79
10/25/88	299	-2.3	-1.2	1005	-4.4	2400	0.42	0.10	81
10/26/88	300	-0.4	4.1	1451	-4.7	0402	0.43	0.18	74
10/27/88	301	0.0	2.8	0031	-4.3	2338	0.50	0.12	92
10/28/88	302	-5.3	-2.7	1523	-9.5	2359	0.31	0.11	74
10/29/88	303	-6.4	0.1	1630	-11.0	0250	0.28	0.11	77
10/30/88	304	-0.4	5.5	1426	-8.8	0321	0.33	0.29	60
10/31/88	305	2.9	6.3	1304	-1.7	2040	0.55	0.21	73
11/1/88	306	1.3	5.0	1318	-1.2	2059	0.56	0.11	84
11/2/88	307	3.0	6.3	1432	-0.6	0645	0.55	0.22	73
11/3/88	308	4.0	11.0	1431	-1.3	0711	0.60	0.23	76
11/4/88	309	2.4	4.9	1610	0.1	0030	0.65	0.08	89
11/5/88	310	-1.6	0.7	0012	-3.5	2400	0.43	0.11	79
11/6/88	311	-1.1	4.8	1526	-5.2	0701	0.36	0.22	67
11/7/88	312	0.0	2.7	1140	-2.6	0142	0.50	0.11	82

¹ Average daily air temperature was estimated from regression of hygrothermograph air temperature. The formula $Y = .945 + .987X$, where Y = Average daily air temperature from 201 probe on the raft and X = Average daily air temperature from the hygrothermograph at the land station, was used. The adjusted R squared for the regression is .986.

² Average daily humidity data was estimated from regression of hygrothermograph humidity. The formula $Y = -6.96 + 1.43X$, where Y = Average daily humidity from 201 probe on the raft and X = Average daily humidity from the hygrothermograph at the land station, was used. The adjusted R squared for the regression is .901.

³ Average daily air temperature was estimated from regression of hygrothermograph air temperature. The formula $Y = 2.47 + .991X$, where Y = Average daily air temperature from 201 probe on the raft and X = Average daily air temperature from the hygrothermograph at the land station, was used. The adjusted R squared for the regression is .964

⁴ Average daily humidity data was estimated from regression of hygrothermograph humidity. The formula $Y = 1.429 + .979X$, where Y = Average daily humidity from 201 probe on the raft and X = Average daily humidity from the hygrothermograph at the land station, was used. The adjusted R squared for the regression is .932

⁵ Average daily vapor pressure is estimated from a regression of vapor pressure calculated from hygrothermograph air temperature. The formula $Y = .114 + 1.011X$, where Y = Average daily vapor pressure calculated from 201 probe on the raft and X = Average daily vapor pressure calculated from hygrothermograph air temperature and humidity at the land station, was used. The adjusted R -squared for the regression is .936.

Table 2.--Wind speeds at raft station on Williams Lake, 1987-88

[Wind speeds are in miles per hour; m, meter; --, missing or no data]

Date	Julian day	Daily average wind speed		Time of maximum wind speed		Minimum wind speed at 1m	Time of minimum wind speed		Daily Average wind speed at 2m	Maximum wind speed		Time of maximum wind speed		Minimum wind speed at 2m	Time of minimum wind speed	
		at 1m	at 1m	1m	1m		1m	at 1m		at 2m	at 2m	2m	2m		at 2m	at 2m
4/30/87	120	4.8	16.8	1047	1047	0.7	1350	4.8	16.5	1047	0.7	0046	0.7	0046	0.7	0046
5/1/87	121	6.6	20.2	1439	1439	0.7	2229	6.8	20.7	1439	0.7	2358	0.7	2358	0.7	2358
5/2/87	122	6.1	19.5	1359	1359	0.7	0019	6.3	22.6	1359	0.7	0502	0.7	0502	0.7	0502
5/3/87	123	7.2	20.1	1041	1041	0.7	0432	7.5	21.0	0820	0.7	0445	0.7	0445	0.7	0445
5/4/87	124	3.8	14.0	0836	0836	0.7	2349	3.8	14.3	1055	0.7	1950	0.7	1950	0.7	1950
5/5/87	125	5.2	18.9	1352	1352	0.7	2400	5.4	19.2	1421	0.7	2400	0.7	2400	0.7	2400
5/6/87	126	3.5	22.6	1328	1328	0.7	2400	3.8	24.7	1328	0.7	0155	0.7	0155	0.7	0155
5/7/87	127	2.8	16.0	1126	1126	0.7	2400	2.9	16.5	1126	0.7	2057	0.7	2057	0.7	2057
5/8/87	128	6.0	23.9	1437	1437	0.7	0729	6.2	25.7	1437	0.7	0631	0.7	0631	0.7	0631
5/9/87	129	3.5	16.1	1122	1122	0.7	2400	3.8	15.4	1122	0.7	2133	0.7	2133	0.7	2133
5/10/87	130	5.6	21.4	1640	1640	0.7	2338	5.9	23.8	1640	0.7	2343	0.7	2343	0.7	2343
5/11/87	131	6.1	21.9	1119	1119	0.7	2400	7.1	21.7	1119	0.7	2233	0.7	2233	0.7	2233
5/12/87	132	8.2	27.6	1446	1446	0.7	0315	8.7	26.0	1446	0.7	0316	0.7	0316	0.7	0316
5/13/87	133	6.9	21.2	1154	1154	0.7	2343	7.3	24.8	1154	0.7	2352	0.7	2352	0.7	2352
5/14/87	134	5.3	19.0	1119	1119	0.7	2359	5.7	19.9	1119	0.6	1946	0.6	1946	0.6	1946
5/15/87	135	6.5	27.9	1344	1344	0.7	2400	6.7	27.7	1239	0.7	0025	0.7	0025	0.7	0025
5/16/87	136	6.3	22.0	1504	1504	0.7	2058	6.5	23.9	1620	0.7	1356	0.7	1356	0.7	1356
5/17/87	137	6.9	21.6	1644	1644	0.7	1207	7.1	21.4	1644	0.7	1153	0.7	1153	0.7	1153
5/18/87	138	8.2	22.1	1250	1250	0.8	0159	8.5	23.5	1552	0.7	1909	0.7	1909	0.7	1909
5/19/87	139	3.4	8.7	1016	1016	0.7	2330	3.3	9.0	0002	0.7	1400	0.7	1400	0.7	1400
5/20/87	140	5.3	14.5	0738	0738	0.7	0025	5.4	15.9	0738	0.7	2115	0.7	2115	0.7	2115
5/21/87	141	6.5	22.1	1347	1347	0.7	0815	7.3	25.5	1356	0.7	0815	0.7	0815	0.7	0815
5/22/87	142	5.5	21.4	0007	0007	0.7	2106	6.1	22.6	0007	0.7	2121	0.7	2121	0.7	2121
5/23/87	143	3.4	12.6	1128	1128	0.7	2343	3.2	12.6	1236	0.7	2132	0.7	2132	0.7	2132
5/24/87	144	3.9	12.1	0916	0916	0.7	2400	3.8	13.6	0916	0.7	2056	0.7	2056	0.7	2056
5/25/87	145	5.6	18.9	2114	2114	0.7	0400	5.7	19.7	2114	0.7	0011	0.7	0011	0.7	0011
5/26/87	146	3.9	9.5	0133	0133	0.7	2156	3.9	10.0	1255	0.7	2321	0.7	2321	0.7	2321
5/27/87	147	6.1	21.1	1628	1628	0.7	2218	6.4	21.3	1628	0.7	2216	0.7	2216	0.7	2216
5/28/87	148	7.7	22.0	1417	1417	1.4	2331	8.3	22.2	1417	1.7	1954	1.7	1954	1.7	1954
5/29/87	149	3.7	10.8	1245	1245	0.7	2400	3.8	11.2	1157	0.7	1752	0.7	1752	0.7	1752
5/30/87	150	2.3	16.9	1336	1336	0.7	0015	2.1	16.6	1336	0.7	2252	0.7	2252	0.7	2252
5/31/87	151	3.3	14.8	2329	2329	0.7	1328	3.3	16.4	2329	0.7	0831	0.7	0831	0.7	0831
6/1/87	152	7.0	20.7	1505	1505	0.7	0934	7.3	20.7	1505	0.7	0934	0.7	0934	0.7	0934
6/2/87	153	8.2	33.0	1459	1459	0.7	1543	8.5	33.8	1459	0.7	1543	0.7	1543	0.7	1543
6/3/87	154	9.2	27.2	0150	0150	0.7	2341	9.7	26.2	0150	0.7	2359	0.7	2359	0.7	2359
6/4/87	155	6.3	23.0	1148	1148	0.7	2257	6.7	24.3	1148	0.7	2211	0.7	2211	0.7	2211
6/5/87	156	4.2	13.9	1020	1020	0.7	2252	4.3	14.5	0949	0.7	2107	0.7	2107	0.7	2107
6/6/87	157	4.4	17.0	1456	1456	0.7	2400	4.7	18.9	1519	0.7	2142	0.7	2142	0.7	2142
6/7/87	158	3.3	17.7	1523	1523	0.7	0707	3.5	17.4	1523	0.7	2216	0.7	2216	0.7	2216

Table 2.-- Wind speeds at raft station on Williams Lake, 1987-88 --Continued

Date	Julian day	Daily average wind speed at 1m	Maximum wind speed at 1m	Time of maximum wind speed at 1m	Minimum wind speed at 1m	Time of minimum wind speed at 1m	Daily Average wind speed at 2m	Maximum wind speed at 2m	Time of maximum wind speed at 2m	Minimum wind speed at 2m	Time of minimum wind speed at 2m
6/8/87	159	4.5	13.9	1127	0.7	2124	5.1	14.0	1252	0.7	2351
6/9/87	160	2.9	12.7	1500	0.7	2048	2.8	12.6	1500	0.7	0808
6/10/87	161	8.5	21.4	1724	2.1	0253	9.1	22.4	1724	2.1	0253
6/11/87	162	7.0	23.8	1451	0.7	2355	7.3	25.0	1643	0.7	2233
6/12/87	163	4.7	19.5	1239	0.7	2257	4.8	21.6	1218	0.7	2250
6/13/87	164	4.1	18.1	1356	0.7	2400	4.1	17.5	1555	0.7	2214
6/14/87	165	4.1	19.0	1255	0.7	0019	4.8	20.1	1242	0.7	2207
6/15/87	166	3.5	12.3	0958	0.7	2306	3.5	12.5	0943	0.7	2306
6/16/87	167	5.4	17.2	1304	0.7	0639	5.7	18.7	1520	0.7	0639
6/17/87	168	5.6	18.1	1041	0.7	2400	5.8	19.9	1015	0.7	1942
6/18/87	169	3.2	15.4	1051	0.7	2352	3.6	17.5	1051	0.7	2056
6/19/87	170	4.1	14.5	1151	0.7	1839	4.2	15.3	1105	0.7	0606
6/20/87	171	4.8	14.3	1322	0.7	2105	4.9	15.5	1453	0.7	2107
6/21/87	172	3.5	9.5	1421	0.7	1919	3.4	10.2	1421	0.7	0911
6/22/87	173	4.0	13.1	1142	0.7	2329	4.0	13.0	1142	0.7	1059
6/23/87	174	6.1	19.1	1139	0.7	2006	6.3	19.7	1139	0.7	2211
6/24/87	175	2.7	16.0	1338	0.7	0626	2.6	15.0	1338	0.7	1945
6/25/87	176	6.9	30.0	0926	0.7	0711	7.1	30.6	0926	0.7	0007
6/26/87	177	8.2	25.7	1057	0.7	2346	8.7	25.8	1244	0.7	2253
6/27/87	178	4.0	18.6	1247	0.7	0533	4.1	18.3	1300	0.7	2317
6/28/87	179	2.5	10.6	1727	0.7	2352	2.6	12.0	1815	0.7	0655
6/29/87	180	5.0	19.8	1339	0.7	2400	5.5	21.3	1326	0.7	2157
6/30/87	181	2.9	17.4	1307	0.7	2357	2.8	19.2	1307	0.7	2228
7/1/87	182	5.6	30.8	1305	0.7	0047	5.8	31.8	1305	0.7	0417
7/2/87	183	6.5	20.2	1434	0.7	2218	6.8	20.2	1513	0.7	2218
7/3/87	184	3.5	14.4	0904	0.7	2400	3.6	14.9	0904	0.7	2310
7/4/87	185	5.3	17.9	1546	0.7	2002	5.3	20.2	1546	0.7	0333
7/5/87	186	3.9	10.6	1215	0.7	2308	3.9	10.8	1215	0.7	2356
7/6/87	187	2.4	10.0	1310	0.7	2104	2.2	10.4	1310	0.7	2104
7/7/87	188	2.9	14.0	1233	0.7	2048	2.9	15.9	1316	0.7	2221
7/8/87	189	2.2	11.3	1441	0.7	0847	2.0	10.8	1228	0.7	2307
7/9/87	190	4.5	24.2	2355	0.7	1958	4.5	24.4	2355	0.7	1231
7/10/87	191	5.5	21.5	2322	0.7	1645	5.6	24.1	0003	0.7	1848
7/11/87	192	3.5	13.5	1722	0.7	2328	3.7	15.6	1608	0.7	2359
7/12/87	193	8.1	22.7	1402	0.7	0322	8.9	24.0	1402	0.7	0328
7/13/87	194	4.8	16.0	1144	0.7	2356	5.2	18.8	0912	0.7	2400
7/14/87	195	3.3	12.9	1246	0.7	2219	3.1	13.5	1246	0.7	2029
7/15/87	196	5.3	17.2	1612	0.7	0616	5.5	18.2	1612	0.7	0949
7/16/87	197	11.1	27.7	1445	3.6	2018	12.0	27.2	1445	3.8	1851

Table 2.-- Wind speeds at raft station on Williams Lake, 1987-88 --Continued

Dste	Julian dsy	Dsily average wind speed at 1m	Maximum wind speed at 1m	Time of maximum wind speed 1m	Minimum wind speed at 1m	Time of minimum wind speed at 1m	Dsily Average wind speed at 2m	Maximum wind speed at 2m	Time of maximum wind speed 2m	Minimum wind speed at 2m	Time of minimum wind speed at 2m
7/17/87	198	5.0	30.8	2024	0.7	2357	5.2	29.9	2024	0.7	1715
7/18/87	199	6.5	16.1	2053	0.7	2238	6.7	16.5	2213	0.7	0149
7/19/87	200	7.2	23.6	1106	0.7	2358	7.4	24.3	0905	0.7	2224
7/20/87	201	3.9	34.0	0506	0.7	2341	3.8	36.5	0506	0.7	2057
7/21/87	202	3.9	20.2	2056	0.7	2319	3.9	22.5	2056	0.7	1731
7/22/87	203	7.3	22.9	1243	0.7	0723	7.7	24.0	1243	0.7	0723
7/23/87	204	5.0	17.8	0318	0.7	2400	5.1	17.7	0329	0.7	2400
7/24/87	205	3.0	12.0	0816	0.7	2347	2.8	11.9	0816	0.7	0120
7/25/87	206	2.5	10.7	1006	0.7	1456	2.3	11.1	1043	0.7	2123
7/26/87	207	4.4	15.3	1214	0.7	2049	4.4	14.6	1214	0.7	0008
7/27/87	208	5.9	15.2	1220	0.8	2048	6.0	16.7	1220	0.7	2048
7/28/87	209	3.1	9.8	0741	0.7	1321	2.9	10.7	1058	0.7	2237
7/29/87	210	2.1	10.9	0925	0.7	2303	2.1	11.3	0925	0.7	2303
7/30/87	211	4.4	15.8	2215	0.7	1713	4.4	16.7	2215	0.7	1713
7/31/87	212	7.5	15.3	1528	1.6	1003	7.8	16.1	1528	0.7	1003
8/1/87	213	4.0	14.7	0420	0.7	2024	4.1	15.7	0420	0.7	2310
8/2/87	214	2.7	19.6	2311	0.7	0358	2.6	19.0	2311	0.7	2050
8/3/87	215	6.5	20.4	1314	0.7	0541	6.7	23.3	1314	0.7	2109
8/4/87	216	4.2	11.2	0519	0.7	2205	4.2	11.2	0519	0.7	2125
8/5/87	217	7.5	21.1	2159	0.7	0938	7.7	24.8	2159	0.7	0938
8/6/87	218	6.5	18.8	1034	0.7	2350	6.9	19.1	1034	0.7	2323
8/7/87	219	2.5	8.7	1436	0.7	2400	2.2	9.4	1407	0.7	2357
8/8/87	220	2.0	8.1	1116	0.7	2347	1.6	8.5	1116	0.7	1744
8/9/87	221	4.8	22.0	1101	0.7	2123	4.8	21.5	1101	0.7	2348
8/10/87	222	6.7	17.4	1709	0.7	0505	7.0	18.3	1630	0.7	0511
8/11/87	223	9.1	26.7	1033	0.7	2219	9.6	28.4	1033	0.7	2219
8/12/87	224	5.6	16.4	1340	0.7	2400	5.6	16.7	1340	0.7	2341
8/13/87	225	2.7	10.2	0915	0.7	2331	2.6	11.2	1425	0.7	2334
8/14/87	226	6.8	19.9	1230	1.8	0401	7.0	21.2	1230	0.7	0401
8/15/87	227	6.1	22.9	1730	0.7	1921	6.3	26.3	1730	0.7	2143
8/16/87	228	5.0	21.1	1725	0.7	2222	5.1	22.2	1725	0.7	2234
8/17/87	229	5.7	20.7	1020	0.7	2248	5.9	21.5	1020	0.7	2307
8/18/87	230	5.7	19.8	1655	0.7	2304	5.9	21.6	1604	0.7	2306
8/19/87	231	3.2	13.1	1205	0.7	2343	3.1	13.9	1612	0.7	2111
8/20/87	232	4.6	17.9	1205	0.7	2026	4.6	18.7	1205	0.7	0557
8/21/87	233	6.0	22.3	1740	0.7	1411	6.1	23.6	1740	0.7	1411
8/22/87	234	6.4	23.3	1438	0.7	2400	6.5	23.6	1438	0.7	2113
8/23/87	235	4.4	16.5	1102	0.7	0005	4.2	16.5	1023	0.7	2059
8/24/87	236	4.1	17.5	1349	0.7	2346	4.1	18.7	1349	0.7	2213

Table 2.-- Wind speeds at raft station on Williams Lake, 1987-88 --Continued

Date	Julian day	Daily average wind speed at 1m	Maximum wind speed at 1m	Time of maximum wind speed at 1m	Minimum wind speed at 1m	Time of minimum wind speed at 1m	Daily Average wind speed at 2m	Maximum wind speed at 2m	Time of maximum wind speed at 2m	Minimum wind speed at 2m	Time of minimum wind speed at 2m
8/25/87	237	3.4	11.9	1653	0.7	2355	3.2	11.2	1938	0.7	2355
8/26/87	238	3.2	10.5	0043	0.7	2345	3.1	10.2	0045	0.7	2345
8/27/87	239	2.0	12.0	1221	0.7	0759	1.6	13.1	1221	0.7	2338
8/28/87	240	2.2	9.4	1316	0.7	2340	1.9	9.6	1316	0.7	2116
8/29/87	241	7.0	28.5	2022	0.7	0156	7.3	28.3	2022	0.7	2125
8/30/87	242	9.1	22.7	1036	0.7	2158	9.5	24.0	1330	0.7	2400
8/31/87	243	5.3	20.8	1229	0.7	2350	5.1	20.3	1054	0.7	2022
9/1/87	244	5.8	22.7	1132	0.7	2159	5.7	22.9	1132	0.7	2159
9/2/87	245	3.6	13.0	2312	0.7	1531	3.4	14.2	2312	0.7	0134
9/3/87	246	8.8	23.5	1543	0.7	0914	9.2	25.5	1543	0.7	1102
9/4/87	247	4.1	15.6	0020	0.7	2358	4.0	16.1	0020	0.7	2217
9/5/87	248	3.0	16.9	0626	0.7	2215	2.7	17.5	0626	0.7	2359
9/6/87	249	3.2	10.9	1318	0.7	0838	3.0	12.8	1328	0.7	0838
9/7/87	250	2.9	10.9	1634	0.7	2359	2.6	11.6	1634	0.7	2400
9/8/87	251	4.3	14.1	1406	0.6	1936	4.3	15.7	1332	0.7	1938
9/9/87	252	4.4	15.5	1130	0.7	2012	4.4	14.9	0313	0.7	1834
9/10/87	253	5.8	19.3	1614	0.7	2357	5.8	19.8	1614	0.7	2400
9/11/87	254	3.6	14.7	1432	0.7	1940	3.4	14.8	1432	0.7	2255
9/12/87	255	2.7	12.0	1141	0.7	2040	2.4	13.2	1141	0.7	2041
9/13/87	256	2.8	12.1	1425	0.7	2400	2.4	12.5	1425	0.7	2240
9/14/87	257	3.8	14.6	1321	0.7	2400	3.6	14.9	1321	0.7	2358
9/15/87	258	2.5	10.2	1240	0.7	2359	2.2	10.5	1240	0.7	2227
9/16/87	259	2.6	18.5	1346	0.7	2400	2.6	16.7	1346	0.7	1852
9/17/87	260	2.3	7.5	0838	0.7	2336	2.0	7.4	1651	0.7	1820
9/18/87	261	3.5	10.1	1050	0.7	0416	3.2	10.7	0816	0.7	0416
9/19/87	262	5.3	15.6	1028	0.7	1915	5.3	16.1	1028	0.7	0503
9/20/87	263	5.1	15.2	0958	0.7	2051	5.1	15.4	1126	0.7	1913
9/21/87	264	3.6	12.8	0949	0.7	2400	3.7	12.4	0949	0.7	2400
9/22/87	265	3.9	16.3	1108	0.7	2347	3.9	15.7	1114	0.7	1914
9/23/87	266	3.8	13.4	1505	0.7	2357	3.7	14.8	1542	0.7	2157
9/24/87	267	2.1	11.8	1339	0.7	0512	1.8	11.9	1339	0.7	0517
9/25/87	268	2.8	12.2	1053	0.7	2152	2.4	13.4	1053	0.7	2153
9/26/87	269	5.7	17.5	1350	0.7	0621	5.8	18.6	1359	0.7	0640
9/27/87	270										
9/28/87	271										
9/29/87	272										
9/30/87	273										
10/1/87	274										
10/2/87	275	7.0	27.8	0019	0.7	2242	7.1	28.6	0013	0.7	2152

Table 2.-- Wind speeds at raft station on Williams Lake, 1987-88 --Continued

Date	Julian day	Daily average wind speed at 1m	Maximum wind speed at 1m	Time of maximum wind speed at 1m	Minimum wind speed at 1m	Time of minimum wind speed at 1m	Daily Average wind speed at 2m	Maximum wind speed at 2m	Time of maximum wind speed at 2m	Minimum wind speed at 2m	Time of minimum wind speed at 2m
10/3/87	276	6.0	18.7	1147	0.7	1806	6.2	19.0	1147	0.7	0444
10/4/87	277	7.8	24.4	1243	0.7	2153	8.2	28.1	2256	0.7	2153
10/5/87	278	12.9	30.9	0852	4.8	0547	13.6	31.1	0852	5.1	2339
10/6/87	279	8.5	21.9	0022	0.7	2350	8.7	22.5	0825	0.7	2355
10/7/87	280	3.6	12.1	1057	0.7	2019	3.4	11.8	1057	0.7	1921
10/8/87	281	9.1	27.6	1127	3.0	1747	9.6	28.1	1127	2.7	1736
10/9/87	282	10.9	27.3	0236	2.7	1533	11.4	30.3	0236	2.3	1550
10/10/87	283	5.3	18.8	1340	0.7	2329	5.4	18.7	1340	0.7	2230
10/11/87	284	5.7	24.5	1122	0.7	2359	5.7	27.3	1122	0.7	2255
10/12/87	285	2.3	10.0	1304	0.7	0342	1.9	9.9	1519	0.7	1151
10/13/87	286	6.0	21.2	0952	0.7	2335	6.2	21.0	0952	0.7	2354
10/14/87	287	2.4	12.4	1013	0.7	2101	2.1	12.4	0936	0.7	2101
10/15/87	288	4.5	12.7	1701	0.7	2340	4.5	14.3	1212	0.7	2244
10/16/87	289	4.2	13.4	2147	0.7	0732	4.2	13.9	2355	0.7	0353
10/17/87	290	5.7	19.1	2245	0.7	1152	5.8	20.9	2245	0.7	1907
10/18/87	291	6.2	21.4	1439	0.7	2339	6.4	21.8	1332	0.7	2045
10/19/87	292	4.8	16.2	1859	0.7	2241	4.8	16.0	1859	0.7	0300
10/20/87	293	7.1	17.4	1435	1.0	0012	7.2	18.2	1435	0.7	0027
10/21/87	294	5.1	12.6	0005	0.7	1216	5.2	13.1	1525	0.7	1905
10/22/87	295	4.1	13.4	0024	0.6	1350	4.3	13.9	0024	0.7	2358
10/23/87	296	3.7	10.5	1446	-0.5	2142	3.9	11.3	1446	0.7	2142
10/24/87	297	3.7	9.6	0013	-0.4	0419	4.2	11.6	0705	0.7	1528
10/25/87	298	8.3	20.5	1534	2.3	0606	9.0	24.6	1417	2.2	0034
10/26/87	299	10.0	26.2	1357	0.7	2210	10.6	30.9	1448	0.7	2343
10/27/87	300	7.8	22.7	1544	0.7	2351	8.0	23.7	1324	0.7	2400
10/28/87	301	3.1	10.3	1129	0.7	1735	2.9	10.9	1129	0.7	0054
10/29/87	302	5.3	16.3	1433	0.7	2400	5.5	16.2	1433	0.7	2128
10/30/87	303	4.0	14.0	0444	0.7	0034	4.0	13.6	0318	0.7	2000
10/31/87	304	5.4	15.5	1230	1.8	1738	5.6	15.4	1230	0.7	2328
4/25/88	116						8.2	23.2	1354	0.7	2124
4/26/88	117						5.1	17.5	1633	0.7	2323
4/27/88	118						3.9	17.7	1025	0.7	2358
4/28/88	119						3.0	15.8	1213	0.7	0254
4/29/88	120						4.5	15.4	1416	0.7	0108
4/30/88	121						8.5	20.5	1543	2.4	1348
5/1/88	122						12.0	33.6	1300	3.4	0524
5/2/88	123						10.8	27.1	1345	2.5	2046
5/3/88	124						6.7	22.8	1114	0.7	1956
5/4/88	125						4.4	14.0	1713	0.7	1539

Table 2.-- Wind speeds at raft station on Williams Lake, 1987-88 --Continued

Date	Julian day	Daily average wind speed at 1 m	Maximum wind speed at 1 m	Time of maximum wind speed at 1 m	Minimum wind speed at 1 m	Time of minimum wind speed at 1 m	Daily average wind speed at 2 m	Maximum wind speed at 2 m	Time of maximum wind speed at 2 m	Minimum wind speed at 2 m	Time of minimum wind speed at 2 m
5/5/88	126						4.1	13.3	1406	0.7	2356
5/6/88	127						10.1	27.9	1415	0.7	0059
5/7/88	128						11.1	29.5	1530	0.7	2129
5/8/88	129						6.5	18.9	1751	0.7	2225
5/9/88	130						9.8	25.5	1457	0.7	2344
5/10/88	131						5.2	23.6	1408	0.7	2341
5/11/88	132						7.6	27.6	0824	0.7	2024
5/12/88	133						9.1	28.0	1837	0.7	0431
5/13/88	134						4.2	12.9	1440	0.7	1405
5/14/88	135						9.1	25.9	1328	0.7	2357
5/15/88	136						10.2	35.2	0820	1.3	0008
5/16/88	137						5.5	17.0	1122	0.7	2357
5/17/88	138						8.5	22.9	1714	0.7	0019
5/18/88	139						11.8	29.7	1140	3.8	1944
5/19/88	140						7.0	19.3	0943	0.7	2016
5/20/88	141						4.1	13.6	0804	0.7	2126
5/21/88	142						6.0	17.5	1627	0.7	0737
5/22/88	143						4.9	18.8	1310	0.7	2211
5/23/88	144						4.6	22.5	1321	0.7	0635
5/24/88	145						3.8	13.9	1106	0.7	0303
5/25/88	146						8.0	23.0	0953	0.7	0536
5/26/88	147						3.5	13.7	2312	0.7	2253
5/27/88	148						3.1	9.8	1755	0.7	2149
5/28/88	149						6.5	20.1	1414	0.7	2349
5/29/88	150						7.4	22.5	1221	0.7	0210
5/30/88	151						8.2	22.5	1514	0.7	0322
5/31/88	152						6.8	25.7	1423	0.7	2331
6/1/88	153						3.6	15.1	1135	0.7	1628
6/2/88	154						3.4	18.6	1447	0.7	2108
6/3/88	155						3.2	11.3	1300	0.7	1531
6/4/88	156						2.4	9.9	1754	0.7	2256
6/5/88	157						3.5	15.0	1501	0.7	2400
6/6/88	158						4.2	16.7	1443	0.7	2215
6/7/88	159						2.7	15.3	2330	0.7	0637
6/8/88	160						7.3	24.0	1648	0.7	2359
6/9/88	161						3.5	12.8	1343	0.7	1207
6/10/88	162						4.7	15.0	1538	0.7	2032
6/11/88	163						7.5	24.0	1344	0.7	0304
6/12/88	164						4.9	18.6	1757	0.7	2356

Table 2.-- Wind speeds at raft station on Williams Lake, 1987-88 --Continued

Date	Julian day	Daily average wind speed at 1m	Maximum wind speed at 1m	Time of maximum wind speed at 1m	Minimum wind speed at 1m	Time of minimum wind speed at 1m	Daily Average wind speed at 2m	Maximum wind speed at 2m	Time of maximum wind speed at 2m	Minimum wind speed at 2m	Time of minimum wind speed at 2m
6/13/88	165						3.4	14.0	0925	0.7	2135
6/14/88	166						8.3	26.8	1357	0.7	0134
6/15/88	167						6.9	20.4	1245	0.7	2309
6/16/88	168						4.8	12.7	2308	0.7	0641
6/17/88	169						7.6	20.5	1233	1.3	1826
6/18/88	170						7.1	25.6	2041	0.7	2249
6/19/88	171						5.3	19.3	1157	0.7	2248
6/20/88	172						2.9	9.5	1803	0.7	1145
6/21/88	173						5.2	21.3	0300	0.7	2300
6/22/88	174						6.0	18.9	1114	0.7	2011
6/23/88	175						6.6	24.1	1113	0.7	0210
6/24/88	176						4.9	24.0	2354	0.7	2305
6/25/88	177						9.3	25.6	0201	0.7	2137
6/26/88	178						2.7	13.2	1304	0.6	1005
6/27/88	179						5.2	17.9	1515	0.7	2016
6/28/88	180						9.9	25.1	1625	2.1	1645
6/29/88	181						9.6	20.5	0737	2.5	2319
6/30/88	182						6.4	16.7	0921	0.7	1332
7/1/88	183						2.2	7.4	1118	0.7	2400
7/2/88	184						2.8	13.8	1153	0.7	2358
7/3/88	185						5.5	22.2	1207	0.7	2159
7/4/88	186						6.3	20.8	1310	0.7	1924
7/5/88	187						9.2	26.3	1547	0.7	0701
7/6/88	188	31.0	1709	2251	0.7	2251	9.0	31.1	1709	0.7	2029
7/7/88	189	18.2	1412	2321	0.7	2321	6.2	19.1	1450	0.7	2321
7/8/88	190	10.4	1407	1335	0.7	1335	2.3	10.4	1407	0.7	1335
7/9/88	191	19.0	1553	2244	0.7	2244	4.9	20.1	1553	0.7	2259
7/10/88	192	20.3	1350	2343	0.7	2343	6.9	20.0	1350	0.7	2359
7/11/88	193	12.6	0845	2105	0.7	2105	3.4	13.5	0845	0.7	2105
7/12/88	194	22.9	1714	2342	0.7	2342	7.6	23.0	1714	0.7	2342
7/13/88	195	24.6	1537	2357	0.7	2357	7.4	27.1	1537	0.7	2111
7/14/88	196	16.7	1756	0551	0.7	0551	4.0	17.2	1724	0.7	0551
7/15/88	197	21.6	1625	2327	0.7	2327	6.8	22.1	1521	0.7	2327
7/16/88	198	15.0	1114	2359	0.7	2359	3.2	14.6	1114	0.7	2133
7/17/88	199	21.0	1046	0343	0.7	0343	5.1	20.7	1348	0.7	2025
7/18/88	200	15.4	1002	2359	0.7	2359	4.1	15.1	1014	0.7	2243
7/19/88	201	17.8	1411	2346	0.7	2346	3.9	20.1	1413	0.7	0555
7/20/88	202	14.8	1530	2357	0.7	2357	3.8	14.9	1530	0.7	2021
7/21/88	203	14.6	1158	2319	0.7	2319	3.4	14.1	1158	0.7	0540

Table 2.-- Wind speeds at raft station on Williams Lake, 1987-88 --Continued

Date	Julian day	Daily average wind speed at 1m	Maximum wind speed at 1m	Time of maximum wind speed 1m	Minimum wind speed at 1m	Time of minimum wind speed at 1m	Daily Average wind speed at 2m	Maximum wind speed at 2m	Time of maximum wind speed 2m	Minimum wind speed at 2m	Time of minimum wind speed at 2m
7/22/88	204		13.1	1130	0.7	1225	3.1	13.6	1130	0.7	1225
7/23/88	205		22.1	1224	0.7	2324	6.8	22.1	1224	0.7	2324
7/24/88	206		17.5	1533	0.7	2400	6.2	17.4	1052	0.7	2000
7/25/88	207		13.7	1156	0.7	2134	2.9	13.3	1034	0.7	0328
7/26/88	208		14.5	0956	0.7	2209	4.8	15.3	0954	0.7	2209
7/27/88	209		25.3	1520	0.7	0513	6.4	26.4	1520	0.7	0513
7/28/88	210		25.6	0930	0.7	2337	6.7	26.7	0930	0.7	2349
7/29/88	211		21.5	1723	0.7	2400	7.4	22.2	1723	0.7	2227
7/30/88	212		15.6	1611	0.7	0656	3.4	16.1	1611	0.7	0656
7/31/88	213						7.9	23.4	1251	0.7	2300
8/1/88	214		24.0	2009	0.7	1220	6.2	25.3	1959	0.7	2250
8/2/88	215		13.7	0127	0.7	2125	3.5	16.2	0128	0.7	2117
8/3/88	216		27.0	1455	0.7	1651	2.7	25.9	1455	0.7	1701
8/4/88	217		12.3	0223	0.7	1851	4.2	12.7	0224	0.7	1853
8/5/88	218		15.0	1613	0.7	2358	4.2	15.9	1613	0.7	1913
8/6/88	219		18.4	1518	0.7	0718	5.3	19.0	1452	0.7	0717
8/7/88	220		25.2	1335	0.7	2258	6.1	24.5	0557	0.7	2302
8/8/88	221		16.8	0924	0.7	2359	4.4	18.0	0924	0.7	2238
8/9/88	222		13.6	1219	0.7	1421	3.9	16.0	1219	0.7	0242
8/10/88	223		22.1	1632	1.4	0429	8.1	21.8	1318	0.7	2312
8/11/88	224		20.6	2210	0.7	1918	5.0	21.6	0147	0.7	2204
8/12/88	225		23.2	0333	0.6	1948	4.6	24.2	0333	0.7	2358
8/13/88	226		0.9	0714	0.7	1123	5.7	15.6	0729	0.7	1416
8/14/88	227		15.9	0923	0.7	2359	4.5	16.4	0923	0.7	2359
8/15/88	228		16.2	1140	0.7	2359	4.5	16.2	1140	0.5	0552
8/16/88	229		29.8	1504	0.7	2356	6.4	31.3	1504	0.7	2356
8/17/88	230		14.5	0515	0.7	1446	4.6	16.2	0515	0.7	0238
8/18/88	231		17.8	1226	0.7	1934	5.2	17.3	1226	0.7	2258
8/19/88	232		8.0	0155	0.7	1149	2.9	8.1	0822	0.7	0534
8/20/88	233		14.8	1438	0.7	0838	5.4	14.7	2229	0.7	0841
8/21/88	234		21.6	0940	0.7	1406	8.6	21.1	0940	0.7	1407
8/22/88	235		24.0	2020	0.7	2352	5.3	24.6	2020	0.7	2356
8/23/88	236		20.1	1306	0.7	2320	5.6	20.7	1306	0.7	2215
8/24/88	237		22.6	1047	0.7	2359	6.6	23.1	1047	0.7	2400
8/25/88	238		25.3	0955	0.7	2304	6.6	26.4	0955	0.7	0145
8/26/88	239		14.0	1136	0.7	0506	3.5	14.8	1231	0.7	0531
8/27/88	240		20.1	1110	0.7	1929	7.6	23.1	1110	0.7	1949
8/28/88	241		16.2	1132	0.7	2357	5.2	17.2	1044	0.7	2400
8/29/88	242		13.7	1507	0.7	2316	3.1	13.2	1507	0.7	0126

Table 2.-- Wind speeds at raft station on Williams Lake, 1987-88 --Continued

Date	Julian day	Daily average wind speed at 1m	Maximum wind speed at 1m	Time of maximum wind speed at 1m	Minimum wind speed at 1m	Time of minimum wind speed at 1m	Daily Average wind speed at 2m	Maximum wind speed at 2m	Time of maximum wind speed at 2m	Minimum wind speed at 2m	Time of minimum wind speed at 2m
8/30/88	243		13.6	1700	0.7	0658	4.7	13.6	1456	0.7	0548
8/31/88	244		16.0	1608	0.7	2251	6.2	16.0	1215	0.7	2248
9/1/88	245		15.4	0238	0.7	1907	4.5	19.9	0234	0.7	2045
9/2/88	246						4.3	24.4	2146	-1.1	1548
9/3/88	247		20.1	1338	1.9	2338	7.5	38.3	0913	-2.1	0638
9/4/88	248		23.0	1230	0.7	2400	6.7	47.4	2400	-1.6	0751
9/5/88	249		13.8	1301	0.7	0147	3.5	53.5	0349	-0.9	0917
9/6/88	250		11.7	1353	0.7	0747	3.5	53.8	0229	-3.2	0857
9/7/88	251		27.2	1058	0.7	2351	7.5	40.3	0654	4.0	1212
9/8/88	252		27.8	1152	0.7	0331	6.5	57.8	2400	4.2	1409
9/9/88	253		35.2	1243	0.7	2400	6.3	62.8	0726	11.5	1303
9/10/88	254		16.8	1941	0.7	0112	4.3	62.7	0421	46.5	1345
9/11/88	255		21.0	0039	0.7	2213	6.7	48.6	0002	16.4	2131
9/12/88	256		20.0	0755	0.7	2359	7.8	53.1	2400	18.2	0001
9/13/88	257		18.0	1642	0.7	2012	4.6	53.2	0007	-6.7	0910
9/14/88	258		9.4	1125	0.7	2353	2.1	56.2	0306	0.3	0914
9/15/88	259		21.0	2302	0.7	0156	6.8	50.0	0430	1.0	1946
9/16/88	260						5.1				
9/17/88	261						2.9				
9/18/88	262						5.4				
9/19/88	263						8.4				
9/20/88	264						7.3				
9/21/88	265						5.0				
9/22/88	266						5.3				
9/23/88	267						5.6				
9/24/88	268						6.2				
9/25/88	269						4.6				
9/26/88	270						4.4				
9/27/88	271						4.9				
9/28/88	272						8.0				
9/29/88	273						2.7				
9/30/88	274						4.1				
10/1/88	275						5.9				
10/2/88	276						4.6				
10/3/88	277						8.3				
10/4/88	278						5.0				
10/5/88	279						2.6				
10/6/88	280						3.8				
10/7/88	281						5.9				

Table 2.-- Wind speeds at raft station on Williams Lake, 1987-88 --Continued

Date	Julian day	Daily average wind speed at 1m	Maximum wind speed at 1m	Time of maximum wind speed at 1m	Minimum wind speed at 1m	Time of minimum wind speed at 1m	Daily Average wind speed at 2m	Maximum wind speed at 2m	Time of maximum wind speed at 2m	Minimum wind speed at 2m	Time of minimum wind speed at 2m
10/8/88	282						1.7				
10/9/88	283						4.4				
10/10/88	284	25.3	1256		3.5	2252	10.5	61.3	2400	4.0	1006
10/11/88	285	15.7	1031		0.7	2158	5.0	63.5	1738	1.3	1252
10/12/88	286	11.0	1521		0.7	1157	3.4	67.5	2400	31.1	0759
10/13/88	287	21.1	1228		0.7	2358	6.7	71.9	0934	2.1	0238
10/14/88	288	14.0	1455		0.7	2108	2.5	57.2	0010	2.2	1004
10/15/88	289	15.0	1111		0.7	2315	3.7	35.8	2353	0.9	0659
10/16/88	290	24.3	1134		0.7	2326	7.5	43.9	2004	4.5	1533
10/17/88	291	16.2	1500		0.7	2104	4.5	60.5	2015	0.3	0315
10/18/88	292	22.6	1641		0.7	2357	5.2	47.9	0215	-6.4	1017
10/19/88	293	14.1	1301		0.7	0041	3.4	59.3	2153	-6.7	1046
10/20/88	294	15.0	1044		0.7	2242	4.3	55.7	0001	-6.7	1557
10/21/88	295	22.7	0757		0.7	1919	6.9	45.2	2019	-2.6	0414
10/22/88	296	27.1	1021		0.7	0424	7.8	22.5	0004	-6.7	0810
10/23/88	297	23.3	1113		-5.2	1303		14.7	0359	-6.7	1127
10/24/88	298	12.8	1545		-0.9	2152		3.6	0707	-0.7	2313
10/25/88	299	11.7	1503		-1.3	2238		2.2	0221	-1.3	2237
10/26/88	300	10.6	2347		-5.2	2013		3.5	0706	-1.3	0444
10/27/88	301	21.2	2133		0.7	2123		44.3	0554	-1.8	2227
10/28/88	302	0.9	0033		0.7	2051		4.7	1644	-6.6	1716
10/29/88	303	0.7	2127		0.7	1903		5.0	1440	-6.3	1136
10/30/88	304	6.6	1512		0.7	1811		67.6	2400	-0.6	1153
10/31/88	305	0.7	1312		0.7	2007		69.3	0218	0.5	1453
11/1/88	306	0.7	1329		0.7	1929		30.3	1524	0.0	0919
11/2/88	307	0.7	2219		0.7	2228		57.4	2400	0.3	1400
11/3/88	308	0.7	2236		0.7	2232		57.9	0156	-3.8	0912
11/4/88	309				0.7	0350		29.9	1641	0.4	1334
11/5/88	310	9.3	1817		0.7	0116	2.6	37.4	0209	-4.8	2215
11/6/88	311	8.3	0038		0.7	2400	4.8	63.1	1901	-6.6	0817
11/7/88	312	4.8	0724		-4.5	0337	2.4	65.8	1342	1.4	1736

¹ Average wind speed at 2 meters was estimated from regression of wind speed at the University of Minnesota climate station at Staples. The formula $\ln Y = .64 + .882 \ln X$ where $\ln Y = \log$ normal wind speed at 2 meters on the raft and $\ln X = \log$ normal wind speed at 1 meter at the University of Minnesota climate station. The R-squared for the regression was .83.

Table 3.--Precipitation for Williams Lake gage and surrounding National Weather Service gages, 1987-88

[Precipitation measured in inches; NWS, National Weather Service; NWS average is a weighted average determined from the distance between the sites and Williams Lake; 0.00, trace precipitation]

Date	Julian day	Precipitation at Williams Lake gauge	NWS precipitation at Deep Portage	NWS precipitation at Park Rapids	NWS precipitation at Pine River	NWS Precipitation at Walker
1/1/87	1					
1/2/87	2					
1/3/87	3					
1/4/87	4					
1/5/87	5					
1/6/87	6					0.01
1/7/87	7					
1/8/87	8					
1/9/87	9			0.00		0.00
1/10/87	10					
1/11/87	11					
1/12/87	12					
1/13/87	13					
1/14/87	14					
1/15/87	15					0.00
1/16/87	16					
1/17/87	17			0.00		
1/18/87	18					
1/19/87	19		0.88	0.10		0.03
1/20/87	20		0.22	0.03		0.00
1/21/87	21		0.44	0.01		0.01
1/22/87	22		0.00	0.00		
1/23/87	23					
1/24/87	24					
1/25/87	25					
1/26/87	26					0.00
1/27/87	27			0.02		0.00
1/28/87	28					0.00
1/29/87	29		0.55	0.12		0.18
1/30/87	30		0.33	0.00		
1/31/87	31					
2/1/87	32					
2/2/87	33			0.18		0.08
2/3/87	34					
2/4/87	35					
2/5/87	36					
2/6/87	37					
2/7/87	38					
2/8/87	39					
2/9/87	40					
2/10/87	41					
2/11/87	42		0.80			
2/12/87	43					
2/13/87	44					
2/14/87	45		0.00			
2/15/87	46					
2/16/87	47			0.03		
2/17/87	48					
2/18/87	49					
2/19/87	50					
2/20/87	51			0.00		
2/21/87	52			0.11		0.06
2/22/87	53			0.02		0.03
2/23/87	54		0.14	0.04		0.00
2/24/87	55			0.21		0.00

Table 3.--Precipitation for Williams Lake gage and surrounding National Weather Service gages, 1987-88 --Continued

Date	Julian day	Precipitation at Williams Lake gauge	NWS precipitation at Deep Portage	NWS precipitation at Park Rapids	NWS precipitation at Pine River	NWS Precipitation at Walker
2/25/87	56					
2/26/87	57					
2/27/87	58					
2/28/87	59			0.00		
3/1/87	60			0.12		0.18
3/2/87	61			0.00		
3/3/87	62					
3/4/87	63					
3/5/87	64					
3/6/87	65					
3/7/87	66					
3/8/87	67					
3/9/87	68					
3/10/87	69					
3/11/87	70			0.00		0.01
3/12/87	71					
3/13/87	72			0.04		0.05
3/14/87	73					0.02
3/15/87	74					
3/16/87	75			0.00		
3/17/87	76					
3/18/87	77					
3/19/87	78			0.00		0.00
3/20/87	79					
3/21/87	80			0.07		0.00
3/22/87	81			0.10		
3/23/87	82			0.98		0.85
3/24/87	83		1.00	0.00		0.22
3/25/87	84			0.00		
3/26/87	85					0.01
3/27/87	86					0.00
3/28/87	87					
3/29/87	88			0.00		
3/30/87	89					
3/31/87	90			0.00		0.02
4/1/87	91			0.04		0.06
4/2/87	92					
4/3/87	93					
4/4/87	94					
4/5/87	95					
4/6/87	96					
4/7/87	97					
4/8/87	98					
4/9/87	99					
4/10/87	100			0.00		
4/11/87	101					
4/12/87	102					
4/13/87	103			0.00		0.00
4/14/87	104					
4/15/87	105					
4/16/87	106					
4/17/87	107					
4/18/87	108					
4/19/87	109					
4/20/87	110			0.15		0.14

Table 3.--Precipitation for Williams Lake gage and surrounding National Weather Service gages, 1987-88 --Continued

Date	Julian day	Precipitation at Williams Lake gauge	NWS precipitation at Deep Portage	NWS precipitation at Park Rapids	NWS precipitation at Pine River	NWS Precipitation at Walker
4/21/87	111					
4/22/87	112					
4/23/87	113					
4/24/87	114					
4/25/87	115					0.00
4/26/87	116			0.00		0.10
4/27/87	117					
4/28/87	118					
4/29/87	119					
4/30/87	120	0.02		0.00		0.19
5/1/87	121					0.06
5/2/87	122					
5/3/87	123					
5/4/87	124					
5/5/87	125					
5/6/87	126					
5/7/87	127					
5/8/87	128					
5/9/87	129					
5/10/87	130			0.04		0.02
5/11/87	131		0.02			
5/12/87	132			0.00		0.01
5/13/87	133	0.30		0.60		0.33
5/14/87	134		0.17			
5/15/87	135	0.09		0.07		0.08
5/16/87	136	0.20	0.05	0.00		
5/17/87	137	1.75		0.73		2.07
5/18/87	138	0.05	1.90	0.64		0.76
5/19/87	139		0.06	0.04		0.04
5/20/87	140	0.93	0.00	0.05		0.21
5/21/87	141	1.13	1.55	1.27		1.65
5/22/87	142	0.31		0.26		0.69
5/23/87	143		0.01			
5/24/87	144			0.00		0.00
5/25/87	145	0.49	0.01	0.73		0.32
5/26/87	146	0.03	0.28	0.26		0.19
5/27/87	147	0.08	0.00	0.03		0.10
5/28/87	148					
5/29/87	149	0.02		0.70		
5/30/87	150	0.36	0.49			0.05
5/31/87	151					0.00
6/1/87	152	0.17		0.78		0.18
6/2/87	153	0.09		0.02		0.30
6/3/87	154					
6/4/87	155					
6/5/87	156					
6/6/87	157					
6/7/87	158			0.00		
6/8/87	159			0.00		
6/9/87	160					
6/10/87	161	0.17		0.10		0.26
6/11/87	162		0.65	0.00		0.00
6/12/87	163					
6/13/87	164					
6/14/87	165					

Table 3.--Precipitation for Williams Lake gage and surrounding National Weather Service gages, 1987-88 --Continued

Date	Julian day	Precipitation at Williams Lake gauge	NWS precipitation at Deep Portage	NWS precipitation at Park Rapids	NWS precipitation at Pine River	NWS Precipitation at Walker
6/15/87	166					
6/16/87	167					
6/17/87	168	0.01		0.09		0.00
6/18/87	169					
6/19/87	170					
6/20/87	171					
6/21/87	172					
6/22/87	173			0.00		
6/23/87	174	0.15		0.10		0.47
6/24/87	175			0.00		0.29
6/25/87	176					0.00
6/26/87	177			0.00		0.01
6/27/87	178					
6/28/87	179	0.01		0.08		
6/29/87	180	0.10		0.06		0.03
6/30/87	181					
7/1/87	182	0.10		0.10		0.30
7/2/87	183	0.05		0.00		0.47
7/3/87	184					
7/4/87	185					
7/5/87	186	0.26	0.18	0.12		0.13
7/6/87	187		0.00			0.01
7/7/87	188					0.00
7/8/87	189					
7/9/87	190					
7/10/87	191	0.35		0.00		
7/11/87	192	0.03	0.78	0.88		0.30
7/12/87	193	0.03	0.10	0.04		0.03
7/13/87	194		0.00			
7/14/87	195	0.03				
7/15/87	196	0.05	0.13	0.24		0.06
7/16/87	197					
7/17/87	198	1.01		0.28		0.27
7/18/87	199	0.40	1.12	1.00		1.65
7/19/87	200	0.62	1.48	0.80		0.95
7/20/87	201	0.53	0.35	0.48		0.45
7/21/87	202	0.77	0.02			
7/22/87	203		0.06	1.33		0.72
7/23/87	204	0.57	0.40	0.29		0.97
7/24/87	205					
7/25/87	206	0.01		0.00		0.01
7/26/87	207			0.00		
7/27/87	208					
7/28/87	209					
7/29/87	210					
7/30/87	211					
7/31/87	212	0.01	0.02	0.00		0.03
8/1/87	213	0.01		0.02		0.02
8/2/87	214	0.04				
8/3/87	215		0.33	0.29		0.13
8/4/87	216					
8/5/87	217	0.02				
8/6/87	218		0.01			0.11
8/7/87	219					
8/8/87	220					

Table 3.--Precipitation for Williams Lake gage and surrounding National Weather Service gages, 1987-88 --Continued

Date	Julian day	Precipitation at Williams Lake gauge	NWS precipitation at Deep Portage	NWS precipitation at Park Rapids	NWS precipitation at Pine River	NWS Precipitation at Walker
8/9/87	221					
8/10/87	222					
8/11/87	223					
8/12/87	224	0.10	0.03	0.20		0.58
8/13/87	225		0.00			
8/14/87	226					
8/15/87	227	1.23	0.33	0.47		0.23
8/16/87	228		1.58	1.90		1.24
8/17/87	229	0.15	0.00	0.07		0.19
8/18/87	230	0.05	0.13	0.32		0.07
8/19/87	231					
8/20/87	232					0.01
8/21/87	233	0.03		0.21		0.05
8/22/87	234		0.02	0.04		
8/23/87	235					
8/24/87	236					
8/25/87	237	0.17	0.00			0.10
8/26/87	238	0.14	0.14	0.12		0.34
8/27/87	239	0.01	0.02			
8/28/87	240					
8/29/87	241	0.22				
8/30/87	242			0.32		0.24
8/31/87	243					
9/1/87	244					0.01
9/2/87	245					
9/3/87	246			0.00		
9/4/87	247			0.00		0.00
9/5/87	248			0.65		0.76
9/6/87	249			0.00		0.00
9/7/87	250	0.01		0.00		0.05
9/8/87	251	0.01		0.02		0.01
9/9/87	252	0.03		0.12		0.26
9/10/87	253	0.08		0.00		0.05
9/11/87	254					0.02
9/12/87	255	0.17		0.25		0.19
9/13/87	256			0.03		0.07
9/14/87	257					
9/15/87	258					
9/16/87	259					
9/17/87	260	0.02				
9/18/87	261	2.19		2.36		2.05
9/19/87	262	0.24		0.38		0.57
9/20/87	263	0.03		0.08		0.11
9/21/87	264					
9/22/87	265					
9/23/87	266					
9/24/87	267			0.02		
9/25/87	268	0.17				
9/26/87	269	0.14				
9/27/87	270	0.01				
9/28/87	271			0.00		
9/29/87	272	0.22		0.02		0.13
9/30/87	273			0.02		
10/1/87	274			0.01		0.02
10/2/87	275					

Table 3.--Precipitation for Williams Lake gage and surrounding National Weather Service gages, 1987-88 --Continued

Date	Julian day	Precipitation at Williams Lake gauge	NWS precipitation at Deep Portage	NWS precipitation at Park Rapids	NWS precipitation at Pine River	NWS Precipitation at Walker
10/3/87	276					
10/4/87	277					
10/5/87	278			0.04		0.12
10/6/87	279			0.12		0.01
10/7/87	280					
10/8/87	281					
10/9/87	282			0.00		
10/10/87	283					
10/11/87	284					
10/12/87	285					
10/13/87	286					
10/14/87	287					
10/15/87	288	0.13		0.14		0.04
10/16/87	289	0.21	0.50	0.11		0.14
10/17/87	290		0.06	0.02		0.10
10/18/87	291					
10/19/87	292					
10/20/87	293	0.08		0.05		0.07
10/21/87	294					0.00
10/22/87	295		0.19	0.15		0.10
10/23/87	296	0.07		0.03		0.00
10/24/87	297	0.10	0.22			0.00
10/25/87	298	0.18		0.11		
10/26/87	299					
10/27/87	300	0.02		0.00		
10/28/87	301			0.00		
10/29/87	302					
10/30/87	303					
10/31/87	304					
11/1/87	305			0.00		
11/2/87	306			0.02		0.02
11/3/87	307		0.16	0.05		0.01
11/4/87	308		0.03	0.03		0.02
11/5/87	309					
11/6/87	310					
11/7/87	311					
11/8/87	312					
11/9/87	313					
11/10/87	314					
11/11/87	315					
11/12/87	316					
11/13/87	317					
11/14/87	318					
11/15/87	319		0.10	0.15		0.06
11/16/87	320		2.10	0.74		0.65
11/17/87	321			0.10		
11/18/87	322					
11/19/87	323			0.00		0.00
11/20/87	324					
11/21/87	325					
11/22/87	326					
11/23/87	327		0.00	0.00		
11/24/87	328					
11/25/87	329					
11/26/87	330					

Table 3.--Precipitation for Williams Lake gage and surrounding National Weather Service gages, 1987-88 --Continued

Date	Julian day	Precipitation at Williams Lake gauge	NWS precipitation at Deep Portage	NWS precipitation at Park Rapids	NWS precipitation at Pine River	NWS Precipitation at Walker
11/27/87	331					
11/28/87	332					
11/29/87	333			0.00		
11/30/87	334		0.00	0.00		0.00
12/1/87	335					
12/2/87	336			0.04		
12/3/87	337			0.13		
12/4/87	338					
12/5/87	339					
12/6/87	340		0.84	1.43		0.70
12/7/87	341			0.00		
12/8/87	342		0.08	0.00		0.01
12/9/87	343		0.00	0.00		0.01
12/10/87	344					
12/11/87	345			0.07		0.01
12/12/87	346		0.05	0.03		0.02
12/13/87	347		0.04	0.01		
12/14/87	348		0.05	0.00		0.00
12/15/87	349		0.04	0.00		0.00
12/16/87	350		0.03	0.00		
12/17/87	351		0.02	0.00		
12/18/87	352			0.00		
12/19/87	353					
12/20/87	354		0.01	0.00		
12/21/87	355		0.05			
12/22/87	356					0.00
12/23/87	357					
12/24/87	358					
12/25/87	359					
12/26/87	360					
12/27/87	361					
12/28/87	362		0.00			
12/29/87	363					
12/30/87	364			0.00		0.03
12/31/87	365			0.19		0.10
1/1/88	1			0.03		
1/2/88	2					
1/3/88	3					
1/4/88	4					
1/5/88	5					
1/6/88	6					
1/7/88	7					
1/8/88	8					
1/9/88	9					
1/10/88	10					
1/11/88	11			0.14		
1/12/88	12			0.61	0.50	
1/13/88	13				0.11	
1/14/88	14				0.02	
1/15/88	15					
1/16/88	16					
1/17/88	17					
1/18/88	18					
1/19/88	19				0.11	
1/20/88	20				0.27	

Table 3.--Precipitation for Williams Lake gage and surrounding National Weather Service gages, 1987-88 --Continued

Date	Julian day	Precipitation at Williams Lake gauge	NWS precipitation at Deep Portage	NWS precipitation at Park Rapids	NWS precipitation at Pine River	NWS Precipitation at Walker
1/21/88	21					
1/22/88	22				0.02	
1/23/88	23			0.07		0.05
1/24/88	24			0.06	0.08	0.30
1/25/88	25				0.09	0.02
1/26/88	26					
1/27/88	27					
1/28/88	28					
1/29/88	29					
1/30/88	30			0.11		0.05
1/31/88	31			0.03	0.02	0.23
2/1/88	32					
2/2/88	33					
2/3/88	34					
2/4/88	35					
2/5/88	36					
2/6/88	37					
2/7/88	38		0.02		0.03	0.03
2/8/88	39			0.04		
2/9/88	40					
2/10/88	41					
2/11/88	42					
2/12/88	43			0.01		
2/13/88	44					
2/14/88	45					
2/15/88	46					
2/16/88	47					
2/17/88	48					
2/18/88	49					
2/19/88	50			0.10		
2/20/88	51					
2/21/88	52					
2/22/88	53					
2/23/88	54					
2/24/88	55					
2/25/88	56					
2/26/88	57					
2/27/88	58					
2/28/88	59					
2/29/88	60					
3/1/88	61					
3/2/88	62					
3/3/88	63					
3/4/88	64					
3/5/88	65					
3/6/88	66					
3/7/88	67					
3/8/88	68			0.48	0.51	0.80
3/9/88	69				0.69	
3/10/88	70					
3/11/88	71					0.90
3/12/88	72			0.10	0.10	0.39
3/13/88	73				0.33	
3/14/88	74					
3/15/88	75					

Table 3.--Precipitation for Williams Lake gage and surrounding National Weather Service gages, 1987-88 --Continued

Date	Julian day	Precipitation at Williams Lake gauge	NWS precipitation at Deep Portage	NWS precipitation at Park Rapids	NWS precipitation at Pine River	NWS Precipitation at Walker
3/16/88	76					
3/17/88	77					
3/18/88	78				0.02	
3/19/88	79					
3/20/88	80				0.02	
3/21/88	81					
3/22/88	82					
3/23/88	83					
3/24/88	84			0.50	0.06	0.82
3/25/88	85			0.03	0.92	0.01
3/26/88	86					
3/27/88	87					
3/28/88	88			0.09		0.14
3/29/88	89				0.13	
3/30/88	90					
3/31/88	91					
4/1/88	92					
4/2/88	93			0.03		0.09
4/3/88	94		0.40	0.17	0.25	0.16
4/4/88	95					
4/5/88	96					
4/6/88	97					
4/7/88	98					
4/8/88	99					
4/9/88	100				0.09	0.12
4/10/88	101					
4/11/88	102					
4/12/88	103					
4/13/88	104					
4/14/88	105					
4/15/88	106					
4/16/88	107					
4/17/88	108					
4/18/88	109					
4/19/88	110					
4/20/88	111					
4/21/88	112					
4/22/88	113					
4/23/88	114					
4/24/88	115					
4/25/88	116					0.02
4/26/88	117					
4/27/88	118					
4/28/88	119					
4/29/88	120					
4/30/88	121					
5/1/88	122					
5/2/88	123					
5/3/88	124					
5/4/88	125					
5/5/88	126					
5/6/88	127					
5/7/88	128	0.36	0.01		0.05	0.48
5/8/88	129	0.06	0.08	0.10	0.29	
5/9/88	130	0.03	0.02	0.18	0.57	0.03

Table 3.--Precipitation for Williams Lake gage and surrounding National Weather Service gages, 1987-88 --Continued

Date	Julian day	Precipitation at Williams Lake gauge	NWS precipitation at Deep Portage	NWS precipitation at Park Rapids	NWS precipitation at Pine River	NWS Precipitation at Walker
5/10/88	131				0.02	
5/11/88	132					
5/12/88	133	0.22	0.11	1.20	0.10	0.28
5/13/88	134	0.07	0.17		0.23	
5/14/88	135	0.15		0.03		0.02
5/15/88	136	0.29		0.04		0.03
5/16/88	137					
5/17/88	138		0.01			
5/18/88	139					
5/19/88	140		0.01		0.07	
5/20/88	141		0.01	0.33		
5/21/88	142		0.01	0.12	0.03	0.11
5/22/88	143	0.02		0.28		0.26
5/23/88	144					
5/24/88	145					
5/25/88	146					
5/26/88	147					
5/27/88	148	0.02	0.15	0.38	1.11	0.13
5/28/88	149					
5/29/88	150					
5/30/88	151					
5/31/88	152					
6/1/88	153					
6/2/88	154			0.24		
6/3/88	155					
6/4/88	156					
6/5/88	157					
6/6/88	158					
6/7/88	159					
6/8/88	160	0.02				0.07
6/9/88	161		0.19		0.15	
6/10/88	162					
6/11/88	163					
6/12/88	164					
6/13/88	165	0.11			0.09	0.04
6/14/88	166	0.26	0.36	0.24	0.49	0.35
6/15/88	167	0.07	0.04	0.08		0.04
6/16/88	168		0.09		0.14	0.01
6/17/88	169					
6/18/88	170	0.56	0.05			
6/19/88	171		0.54	0.06	0.52	0.62
6/20/88	172					
6/21/88	173	1.32	0.56	1.16	0.36	0.54
6/22/88	174		0.25	0.02	0.25	
6/23/88	175		0.04			0.01
6/24/88	176		0.03			
6/25/88	177					
6/26/88	178					
6/27/88	179					
6/28/88	180	0.12	0.13		0.37	0.08
6/29/88	181		0.03	0.13		
6/30/88	182					
7/1/88	183					
7/2/88	184					
7/3/88	185					

Table 3.--Precipitation for Williams Lake gage and surrounding National Weather Service gages, 1987-88 --Continued

Date	Julian day	Precipitation at Williams Lake gauge	NWS precipitation at Deep Portage	NWS precipitation at Park Rapids	NWS precipitation at Pine River	NWS Precipitation at Walker
7/4/88	186					
7/5/88	187					
7/6/88	188	0.40				1.47
7/7/88	189		0.02	1.73		
7/8/88	190					
7/9/88	191					
7/10/88	192				0.40	
7/11/88	193					
7/12/88	194	0.47				
7/13/88	195	0.07	0.79	0.54	0.82	0.35
7/14/88	196		0.07			
7/15/88	197					
7/16/88	198					
7/17/88	199					
7/18/88	200					
7/19/88	201	0.05		0.08		0.03
7/20/88	202		0.09	0.28	0.10	0.29
7/21/88	203					
7/22/88	204	0.01	0.06		0.16	
7/23/88	205	0.39				
7/24/88	206		0.29	0.15	0.09	0.93
7/25/88	207					
7/26/88	208					
7/27/88	209					
7/28/88	210	0.05	0.04			
7/29/88	211	0.02			0.09	0.40
7/30/88	212					
7/31/88	213	0.36	0.39	0.26	0.55	0.52
8/1/88	214	1.54	0.02	0.36	0.02	0.10
8/2/88	215	0.44	0.78	2.69	0.40	1.76
8/3/88	216	0.11	0.08	0.04	0.15	
8/4/88	217		0.88	0.08	0.28	0.29
8/5/88	218		0.24	0.43	0.36	0.80
8/6/88	219		0.05			
8/7/88	220			0.85		1.40
8/8/88	221		0.70		0.38	
8/9/88	222				0.01	
8/10/88	223					
8/11/88	224	0.25	0.07	0.10		
8/12/88	225	0.04	0.38	0.19	1.35	0.53
8/13/88	226	2.17	0.42	1.54		2.76
8/14/88	227	0.01	1.32		1.98	0.01
8/15/88	228					
8/16/88	229					
8/17/88	230	0.02		0.03		0.01
8/18/88	231					0.01
8/19/88	232					
8/20/88	233					
8/21/88	234	0.11		0.15		0.03
8/22/88	235	0.17	0.08	0.39	0.08	0.20
8/23/88	236		0.57	0.16	0.79	0.06
8/24/88	237					
8/25/88	238					
8/26/88	239					0.02
8/27/88	240				0.01	

Table 3.--Precipitation for Williams Lake gage and surrounding National Weather Service gages, 1987-88 --Continued

Date	Julian day	Precipitation at Williams Lake gauge	NWS precipitation at Deep Portage	NWS precipitation at Park Rapids	NWS precipitation at Pine River	NWS Precipitation at Walker
8/28/88	241					
8/29/88	242					
8/30/88	243					
8/31/88	244					
9/1/88	245	0.70	0.72		0.47	0.75
9/2/88	246	0.06				0.03
9/3/88	247	0.16	0.15		0.27	0.14
9/4/88	248	0.31				
9/5/88	249	0.11				
9/6/88	250					
9/7/88	251	1.21				
9/8/88	252					
9/9/88	253					
9/10/88	254					
9/11/88	255					
9/12/88	256				0.09	0.08
9/13/88	257					
9/14/88	258					
9/15/88	259	0.24				0.03
9/16/88	260	0.44	0.56		0.65	0.61
9/17/88	261	0.19			0.64	0.14
9/18/88	262	0.05	0.89			0.18
9/19/88	263	0.98			1.11	0.68
9/20/88	264	0.09	0.53		1.14	
9/21/88	265					0.03
9/22/88	266		0.06		0.02	0.11
9/23/88	267					
9/24/88	268					
9/25/88	269					0.01
9/26/88	270					
9/27/88	271					
9/28/88	272	0.50				0.06
9/29/88	273	0.01	0.51		0.89	0.37
9/30/88	274				0.02	
10/1/88	275					
10/2/88	276					
10/3/88	277					
10/4/88	278					
10/5/88	279					
10/6/88	280					
10/7/88	281					
10/8/88	282					
10/9/88	283					
10/10/88	284					
10/11/88	285					
10/12/88	286		0.08			
10/13/88	287					
10/14/88	288					
10/15/88	289					
10/16/88	290	0.01			0.05	0.12
10/17/88	291	0.13		0.18	0.04	0.06
10/18/88	292	0.02	0.14	0.06	0.19	0.05
10/19/88	293				0.20	
10/20/88	294	0.34	0.40	0.32		0.30
10/21/88	295	0.01			0.44	

Table 3.--Precipitation for Williams Lake gage and surrounding National Weather Service gages, 1987-88 --Continued

Date	Julian day	Precipitation at Williams Lake gauge	NWS precipitation at Deep Portage	NWS precipitation at Park Rapids	NWS precipitation at Pine River	NWS Precipitation at Walker
10/22/88	296	0.04				
10/23/88	297		0.09		0.07	0.03
10/24/88	298					
10/25/88	299					
10/26/88	300					
10/27/88	301	0.06		0.12		0.06
10/28/88	302			0.09		
10/29/88	303					
10/30/88	304					
10/31/88	305		0.30			
11/1/88	306					
11/2/88	307					
11/3/88	308					
11/4/88	309					
11/5/88	310			0.02		
11/6/88	311					
11/7/88	312					0.01
11/8/88	313			0.05	0.05	
11/9/88	314				0.18	0.11
11/10/88	315			0.07		
11/11/88	316					
11/12/88	317		0.20		0.80	0.47
11/13/88	318		0.30	0.50	0.11	
11/14/88	319					
11/15/88	320					0.16
11/16/88	321			0.16	0.60	
11/17/88	322			0.12	0.04	
11/18/88	323					
11/19/88	324		0.25	0.07	0.44	
11/20/88	325			0.12		
11/21/88	326					
11/22/88	327				0.13	
11/23/88	328					
11/24/88	329					
11/25/88	330					
11/26/88	331			0.20	0.25	
11/27/88	332			0.30	2.75	0.30
11/28/88	333		0.72		0.30	0.20
11/29/88	334					
11/30/88	335			0.01		
12/1/88	336					
12/2/88	337					
12/3/88	338					
12/4/88	339					
12/5/88	340					0.01
12/6/88	341					
12/7/88	342					0.01
12/8/88	343					0.01
12/9/88	344					
12/10/88	345					
12/11/88	346					
12/12/88	347			0.09		
12/13/88	348				0.03	
12/14/88	349		0.48	0.29	0.42	0.37
12/15/88	350					

Table 3.--Precipitation for Williams Lake gage and surrounding National Weather Service gages, 1987-88 --Continued

Date	Julian day	Precipitation at Williams Lake gauge	NWS precipitation at Deep Portage	NWS precipitation at Park Rapids	NWS precipitation at Pine River	NWS Precipitation at Walker
12/16/88	351		0.09	0.06	0.04	
12/17/88	352					
12/18/88	353		0.05		0.05	
12/19/88	354					
12/20/88	355					
12/21/88	356					
12/22/88	357					
12/23/88	358				0.19	0.05
12/24/88	359					
12/25/88	360					
12/26/88	361				0.03	0.30
12/27/88	362		0.55	0.32	0.47	0.25
12/28/88	363					
12/29/88	364				0.02	
12/30/88	365		0.02			
12/31/88	366					