

DELINEATION OF SIMILAR SUMMER CLIMATIC REGIMES
IN CENTRAL ALBERTA

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ABSTRACT

A climatic classification was developed for a portion of central Alberta between latitude 53°10' and 56°10'N at a scale detailed enough to be useful to management agencies. Previous classifications either were not as detailed or had incorporated subjective biases into their zonations. Data base consisted of daily temperature and precipitation records from 54 stations for the months May to September for the years 1954 to 1968. Data sets for stations with some missing data were completed by polynomial regression prediction techniques. Seventy-five climatic variables were compiled for each station which became input for the factor analysis model. Eigenvalues and eigenvectors were developed from the factor analysis such that 75% of the total variance was attributable to the first three eigenvalues. Coefficients of each of these three factors were then generated for each station in the form of factor scores. An algorithmic grouping procedure was then used to classify the stations with a similar climate into groups. When a least explained group variance of 1% was used, thirteen climatic areas were delineated.

¹ Based in part on work recorded in a M.Sc. thesis submitted to the Faculty of Graduate Studies and Research, University of Alberta, Edmonton, Spring, 1970.

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TABLE OF CONTENTS

	<u>Page</u>
<i>ABSTRACT</i>	1
<i>INTRODUCTION</i>	2
<i>METHODS AND MATERIALS</i>	2
<i>Study Area</i>	2
<i>Primary Data Input</i>	4
<i>Data Generation</i>	4
<i>Statistical Methods</i>	7
<i>RESULTS AND DISCUSSION</i>	10
<i>LITERATURE CITED</i>	20
<i>APPENDIX A - CLIMATIC DATA, 1954-1968</i>	22
FIGURE 1. Location of study area in Alberta.....	3
FIGURE 2. Location of climatic stations with elevations..	5
FIGURE 3. Smoothed statistical climatic zones.....	16
TABLE 1. Observed versus predicted monthly mean temperature values for Fairview in 1967.....	6
TABLE 2. Input climatic variables for statistical analysis.....	8
TABLE 3. Selected factor matrix of input variables.....	11
TABLE 4. Algorithmically grouped factor scores per station.....	13
TABLE 5. Selected seasonal normals (1 May - 30 September) 1954-1968.....	15

INTRODUCTION

The forest land capability section of the Canada Land Inventory, forest management and related forest research agencies require climatological information and climatic classification to assess forest land use productivity and to conduct and apply forest management research.

Various climatic classifications have been produced for Alberta (Köppen 1924, Rheumer 1953, Chapman and Brown 1966, Bowser 1967 and Longley 1970) and other models - Thornthwaite and Mathers (1955), Holdridge (1959), and Newnham (1968) for use elsewhere. Many lack the detail desired for management purposes; often the province is classified into only one or two zones. Though the studies of Chapman and Brown and Bowser are adequate for agricultural purposes, they provide only one zone for forested areas. The subjective grouping of stations according to predetermined classes is a bias in these traditional or classical approaches. Newnham (1968) utilized principal component analysis to group representative stations into climatic regions in British Columbia for forestry purposes. However, no adequate classification exists for forested areas of Alberta. This prompted a study of climatic summer regimes in an area across central Alberta. This paper briefly describes the methodology used to classify areas having similar summer climatic regimes. Background to the method is given in MacIver (1970).

METHODS AND MATERIALS

Study Area

An area in Alberta between latitude 53°10' and 56°10'N was selected (Fig. 1). This area has varied topography, soils and vegetation cover, and has a dense network of climatological reporting stations.

LOCATION OF STUDY AREA IN ALBERTA

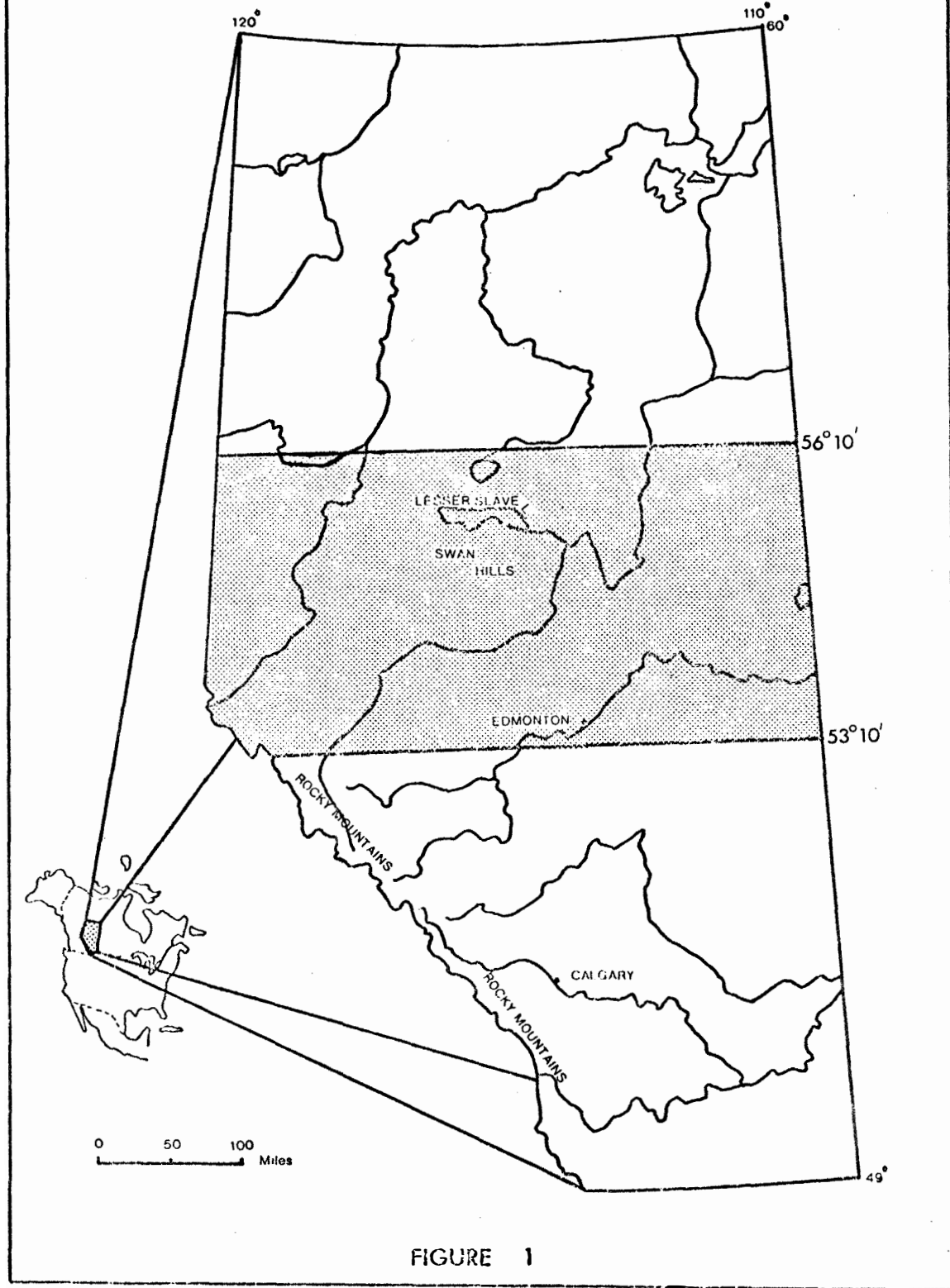


FIGURE 1

Primary Data Input

The Atmospheric Environment Service meteorological stations, the co-operative climatological stations and the Alberta Forest Service stations provide 131 reporting stations in the area. Of these, 54 were chosen because they had close to 15 years of continuous records (Fig. 2). The period 1954-1968 was selected, allowing the inclusion of many forestry stations. The study was limited to the summer growing period, May 1 to September 30. Number four daily climatological cards from the Atmospheric Environment Service provided the daily precipitation and maximum and minimum temperatures for the analysis.

Some forestry stations often do not open until sometime in May and close before the end of September. The actual period of operation depends on fire conditions. Frequently, data within the five-month period were missing due to instrument breakage or the absence of the observer.

Data Generation

Because many stations did not have daily data, statistical estimation techniques were employed to complete reports for each station. Polynomial regression techniques were applied to generate maximum and minimum temperature values for the missing data days. Six base stations - Grande Prairie, Edson, Meanook, Ranfurly, High Prairie and Whitecourt, each having complete daily data sets - were chosen as base stations for applying this technique to the station network.

For all combinations of station data, third degree estimation of temperature extremes was found to be statistically sufficient.

LOCATION OF CLIMATIC STATIONS WITH ELEVATIONS (IN FEET A.M.S.L.)

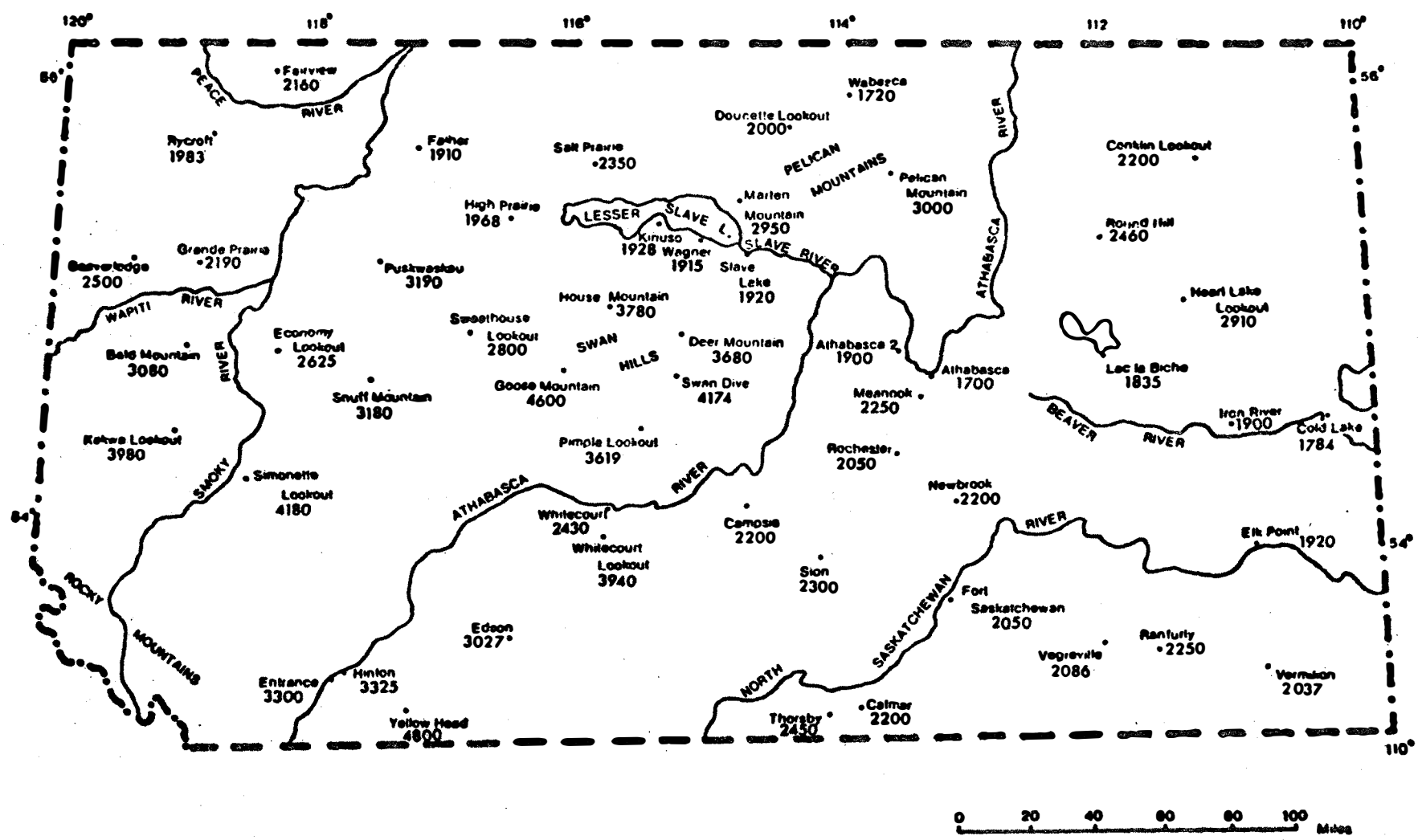


Figure 2

Generally, the equation is represented in the form:

$$Y = a + B_1x^2 + B_2x^2 + . . . + B_kx^k + e$$

where Y is the dependent variable (e.g. Fairview daily maximum temperature); a is the Y - intercept; B_i ($i=1...K$) are the regression coefficients; x is the independent variable (e.g. Grande Prairie daily maximum temperature); and e is the standard error of the regression coefficients.

To test the accuracy of this technique, monthly means were derived from the predicted daily values for Fairview and compared to those in the Monthly Record (Canada Department of Transport, 1967) (Table 1). Since the largest discrepancy (residual) is $+0.8^\circ\text{F}$, the technique appears sufficiently accurate for the purposes of macroclimatic research.

TABLE 1. OBSERVED VERSUS PREDICTED MONTHLY MEAN TEMPERATURE VALUES FOR FAIRVIEW IN 1967.

Month	Observed Monthly Mean Temperature ($^\circ\text{F}$)	Predicted Monthly Mean Temperature ($^\circ\text{F}$)	Residuals ($^\circ\text{F}$)
May	49.0	49.5	+0.5
June	56.8	57.6	+0.8
July	61.7	61.4	-0.3
August	64.2	63.9	-0.3
September	56.2	56.8	+0.6

A null hypothesis to test the predicted values minus the observed values was established such that there was no significant difference between the observed and predicted temperatures at the 99.9 percent significance level. Using analysis of variance testing on each pair of prediction stations, only one failed to satisfy the above

criteria. Carrot Creek versus the base station Edson proved significant only at the 95 percent level and was eliminated from further analysis.

Since precipitation was discontinuous, regression coefficients became biased due to higher frequency of no-rain days as opposed to rain days. Therefore, if a station reported precipitation for 12 years or more, the resulting averages were tested and, in most cases, taken to be representative of the study period.

A list of the 75 variables serving as input for the later statistical analysis is outlined in Table 2. Many were readily generated from daily temperature and precipitation data: degree-days, potential evapotranspiration, water deficit, frost-free period.

Statistical Methods

Several methods of statistical discrimination between values are available: polynomials, simple linear and multiple regression, principal component analysis, factor analysis, cluster analysis and multiple discriminant analysis. The latter technique assumes an a priori grouping of station variables thereby demanding pre-defined class limits, which are not assumed in other techniques. It was therefore eliminated from consideration. Newnham (1968) used principal component analysis and plotted the normalized variables for British Columbia. Factor analysis, which is similar to principal-component analysis, was used for this classification. Factor analysis is aptly described by Harman (1967), King (1969) and others. Fundamentally, it reduces large numbers of input indices to a smaller number of statistically significant indices. The classical factor analysis model

TABLE 2

INPUT CLIMATIC VARIABLES FOR STATISTICAL ANALYSIS

REFERENCE VARIABLE NUMBER	VARIABLE DESCRIPTION
1	Elevation in feet above MSL
2	Latitude in degrees and minutes North
3	Longitude in degrees and minutes West
4	May Mean Daily Temperature in °F
5	June Mean Daily Temperature in °F
6	July Mean Daily Temperature in °F
7	Aug Mean Daily Temperature in °F
8	Sept Mean Daily Temperature in °F
9	May Mean Total Precip.
10	June Mean Total Precip.
11	July Mean Total Precip.
12	Aug Mean Total Precip.
13	Sept Mean Total Precip.
14	May Mean Daily Maximum Temperature in °F
15	June Mean Daily Maximum Temperature in °F
16	July Mean Daily Maximum Temperature in °F
17	Aug Mean Daily Maximum Temperature in °F
18	Sept Mean Daily Maximum Temperature in °F
19	May Mean Daily Minimum Temperature in °F
20	June Mean Daily Minimum Temperature in °F
21	July Mean Daily Minimum Temperature in °F
22	Aug Mean Daily Minimum Temperature in °F
23	Sept Mean Daily Minimum Temperature in °F
24	May Mean Number of days above 32 °F
25	June Mean Number of days above 32 °F
26	July Mean Number of days above 32 °F
27	Aug Mean Number of days above 32 °F
28	Sept Mean Number of days above 32 °F
29	May Mean Number of days above 42 °F
30	June Mean Number of days above 42 °F
31	July Mean Number of days above 42 °F
32	Aug Mean Number of days above 42 °F
33	Sept Mean Number of days above 42 °F
34	May Mean Number of days above 28 °F
35	June Mean Number of days above 28 °F
36	July Mean Number of days above 28 °F
37	Aug Mean Number of days above 28 °F
38	Sept Mean Number of days above 28 °F
39	May Degree-days above 28 °F
40	June Degree-days above 28 °F
41	July Degree-days above 28 °F
42	Aug Degree-days above 28 °F
43	Sept Degree-days above 28 °F
44	May Degree-days above 32 °F
45	June Degree-days above 32 °F
46	July Degree-days above 32 °F
47	Aug Degree-days above 32 °F
48	Sept Degree-days above 32 °F
49	May Degree-days above 42 °F
50	June Degree-days above 42 °F
51	July Degree-days above 42 °F
52	Aug Degree-days above 42 °F
53	Sept Degree-days above 42 °F
54	May Potential Evapotransp. in inches
55	June Potential Evapotransp. in inches
56	July Potential Evapotransp. in inches
57	Aug Potential Evapotransp. in inches
58	Sept Potential Evapotransp. in inches
59	May Actual Evapotransp. in inches
60	June Actual Evapotransp. in inches
61	July Actual Evapotransp. in inches
62	Aug Actual Evapotransp. in inches
63	Sept Actual Evapotransp. in inches
64	May Water Deficit in inches
65	June Water Deficit in inches
66	July Water Deficit in inches
67	Aug Water Deficit in inches
68	Sept Water Deficit in inches
69	May Mean Day length in hours and minutes
70	June Mean Day length in hours and minutes
71	July Mean Day length in hours and minutes
72	Aug Mean Day length in hours and minutes
73	Sept Mean Day length in hours and minutes
74	Frost-Free Period in days
75	Killing Frost-Free Period in days

for a variable j is:

$$Z_j = \sum_{x=1}^m a_{jx} F_x e_j \quad j=1,2,\dots,n$$

where F is the value of the common factor x; a_{jx} is the "corresponding factor to the linear composite" (Harman (1967), p. 15); n is the number of cases; and e is the residual error in the observed values of Z_j .

Replacing the diagonal elements of the correlation matrix (R) with values other than unity distinguishes factor analysis from principal component analysis. MacIver (1970) summarizes the subsequent steps associated with factor analysis; these involve the development of eigenvalues and eigenvectors.

In this approach only eigenvalues greater than unity were considered and only if they explained at least 5% of the total variance (King, 1969). As such, 75% of the total variance is attributable to the first three eigenvalues and associated eigenvectors. Any interrelations inherent in the original input variables are, at this point, represented as independent orthogonal factors (three, in this case). Orthogonality, or rotation of the axis, provides a set of factors "which has the property that any given factors will be fairly highly correlated with some indices (coefficients of the factor matrix) but uncorrelated with the rest." (Blalock, 1960, p. 385). The coefficients of the significant three factors generated indices per station in the form of factor scores. Factor scores per station are calculated by:

$$Z_{ij} = (x_{ij} - \bar{x}_i) / A_j$$

where $(x_{ij} - \bar{x}_i)$ is the input variable deviation from the mean and A_j is the rotated unnormalized factor matrix.

Since the first three factors were statistically significant, using a three-dimensional plotting of the station indices maximized the inter-group distances and minimized the intra-group dispersion. The grouping procedure determines the dependence of the clustered stations primarily upon the distance between the three dimensional factor score co-ordination. Discriminant iteration at various levels of significance per group identifies the similar indices. Two levels of significance can be stipulated - explained variance per group and/or the cumulative explained variance for all groups. Reducing the explained variance per group allows the classifier to alter the number of resulting clusters. At the scale deemed to best fit the prescribed objectives, a least explained group variance of 1% was used such that the resulting climatic areas are thirteen in number. However, if a group variance of 2% was used nine climatic areas would be delineated and if 3% was used then only four climatic areas would be delineated.

RESULTS AND DISCUSSION

When only those eigenvalues greater than unity are considered the first ten characteristic roots explain 91.6% of the total variance. If only those eigenvalues contributing more than 5% of the total variance are considered, then only the first three factors, which account for 75% of the total variance, need be considered in the subsequent analysis. Using only these three vectors of coefficients the calculated factor matrix for the input variables is given in Table 3.

Factor one is best described as an indication of general climate. Accounting for 46% of the total variance the dominant variables are: elevation; mean daily temperature (all five months); May to August

TABLE 3
SELECTED FACTOR MATRIX OF INPUT VARIABLES

VARIABLE NUMBER	I	II	III	VARIABLE NUMBER	I	II	III
1	-.70	.42	.40	38	.53	.68	.20
2	.006	.45	-.86	39	.98	-.09	-.01
3	-.20	.26	-.080	40	.97	-.11	.06
4	.98	-.987	.004	41	.94	-.15	.09
5	.97	-.100	.071	42	.96	-.17	.05
6	.92	-.115	.127	43	.96	-.11	.04
7	.97	-.155	.040	44	.98	-.085	-.018
8	.834	-.116	.244	45	.97	-.113	.052
9	-.52	.34	.41	46	.94	-.155	.09
10	-.65	.439	.316	47	.96	-.17	.048
11	-.64	.44	.006	48	.96	-.11	.043
12	-.65	.31	.53	49	.97	-.049	-.008
13	-.40	.286	.47	50	.98	-.12	.03
14	.75	-.62	-.027	51	.95	-.17	.07
15	.76	-.60	-.016	52	.96	-.17	.06
16	.71	-.56	.15	53	.96	-.08	.06
17	.73	-.63	.04	54	.86	-.16	-.02
18	.67	-.68	.08	55	.92	-.096	-.02
19	.62	.71	.06	56	.88	-.189	-.049
20	.68	.63	.17	57	.90	-.21	-.04
21	.73	.57	.08	58	.74	-.160	.025
22	.69	.62	.04	59	.86	-.199	-.02
23	.54	.73	.16	60	-.17	.099	.214
24	.56	.75	.08	61	-.587	.39	.19
25	.48	.68	.02	62	-.568	.31	.44
26	.23	.31	.28	63	-.41	.42	.56
27	.52	.62	.03	64	.33	.45	.03
28	.53	.78	.04	65	.43	.11	-.17
29	.63	.64	.03	66	.32	-.05	-.08
30	.71	.59	.099	67	.375	.039	-.289
31	.63	.61	.03	68	-.0188	-.087	.057
32	.63	.65	.03	69	.053	.453	-.85
33	.55	.73	.07	70	-.001	.474	-.80
34	.43	.76	.12	71	.02	.478	-.84
35	.08	.33	.56	72	.05	.46	-.85
36	.13	.18	.29	73	.10	.396	-.86
37	.18	.22	.32	74	.44	.80	-.06
				75	.40	.82	.06

mean daily maximum temperature; July mean daily minimum temperature; mean number of June days above 42°F; degree-days above all three base temperatures (28°F, 32°F, and 42°F) for all five months; mean monthly potential evapotranspiration (all five months) and mean May actual evapotranspiration.

Factor two, accounting for 19% of the variance, is generally an indicator of selected May to September thermal values and frost-free periods. The selected temperature variables consist of May and September mean number of days above 32°F, September mean number of days above 42°F, and May mean number of days above 28°F.

Factor three, accounting for only 9% of the total variance, is denoted by photoperiod and latitude variables.

Factor scores and groupings of the stations into thirteen clusters is given in Table 4.

Additional stations not within the study area but in adjacent areas, or stations within the study area but not included in the analysis, can easily be added to the existing climatic zones. Factor scores can be calculated for these stations and the scores placed within the limits of the clusters defined in Table 4. If, however, the factor scores do not fit the classes described, re-analysis of the study area data bank with the associated additional stations is not complicated.

Since there were so many input variables, 75 per station, the predominant variables in the thirteen climatic groups were selected (Table 5). The interrelations of these variables account for similar groupings, but their tabulation provides a simple description of large-scale climates.

Figure 3 shows the groupings of the stations into climatic areas. Area boundaries have been adjusted when this was indicated from

TABLE 4

ALGORITHMICALLY GROUPED FACTOR SCORES PER STATION














GROUP NUMBER	STATION	FACTOR 1	FACTOR 2	FACTOR 3
1	Athabasca 2	.4334	.3788	- .0318
2	Yellowhead Lookout	-1.6216	-0.1124	-1.7843
	Goose Mtn Lo.	-2.6930	-1.0332	.0849
	Whitecourt Lo.	-2.6179	- .7900	- .9945
	Simonette Lo.	-1.6058	- .2357	- .5285
	MEAN	-2.1346	- .5428	- .8056
	STANDARD DEVIATION	<u>+</u> .6023	<u>+</u> .4401	<u>+</u> .7881
3	Rycroft	.9765	- .9715	1.6280
	Round Hill	- .7583	- .8259	.9467
	Conklin	- .4328	.3637	1.1989
	Wabasca	.5268	- .2251	1.6133
	Slave Lake	.2093	- .6830	.9842
	Kinuso	.2179	-1.0293	.9665
	High Prairie	.4609	- .4656	1.0277
	Falher	.4244	- .2480	1.6017
	Salt Prairie	-1.0180	-1.0247	1.5529
	Wagner	.0519	- .1926	.9900
	MEAN	.0659	- .5304	1.2510
	STANDARD DEVIATION	<u>+</u> .6212	<u>+</u> .4582	<u>+</u> .3078
4	Snuff Mtn	- .6832	1.6031	- .4517
	Sweathouse	- .3498	.8817	- .0171
	Puskwaskaw	- .4402	1.1712	.3586
	Economy	.0614	1.0095	- .0462
	Bald Mtn	- .1988	1.1218	- .1279
	MEAN	- .3221	1.1575	- .0569
	STANDARD DEVIATION	<u>+</u> .2772	<u>+</u> .2729	<u>+</u> .2895
5	Calmar	.9947	.3786	-1.8688
	Thorsby	.7737	.3280	-1.7708
	MEAN	.8842	.3533	-1.8198
	STANDARD DEVIATION	<u>+</u> .1563	<u>+</u> .0358	<u>+</u> .0693
6	Vermilion A.	1.1387	- .0839	-1.4115
7	Doucette	.3492	.2218	1.5939
	Grande Prairie	.8542	.4686	.6724
	Beaverlodge	.3180	.1170	.6469
	Fairview	.9209	.6593	1.7381
	MEAN	.6106	.3667	1.1628
	STANDARD DEVIATION	<u>+</u> .3212	<u>+</u> .2445	<u>+</u> .5840

TABLE 4 (continued)

GROUP NUMBER	STATION	FACTOR 1	FACTOR 2	FACTOR 3
8	Meanook	.3650	1.5405	- .4295
9	Iron River	1.0735	- .0790	-0.0732
	Lac la Biche	1.0973	.2130	.2117
	Cold Lake	1.2180	.6621	- .1478
	MEAN	1.1296	.2654	- .0031
	STANDARD DEVIATION	\pm .0775	\pm .3733	\pm .1897
10	Swan Dive	-1.3858	.8136	- .3632
	House Mtn	-1.1124	.7334	.2341
	Pimple Mtn	-1.4976	1.0676	- .6449
	Marten Mtn	-1.2689	.6999	.7995
	Pelican Mtn	- .7902	.2896	1.1783
	Heart Lake	- .7516	.4451	.3223
	Kakwa Mtn	-1.2103	.1368	- .3926
	Deer Mtn	-1.2089	.6913	- .0051
	MEAN	-1.153	.6097	.1411
	STANDARD DEVIATION	\pm .2638	\pm .3011	\pm .6244
11	Newbrook	.3072	-1.3898	- .1074
	Campsie	.7868	-1.2583	- .3543
	Edson	.4717	-1.6848	-1.0323
	Hinton	.2439	-2.0093	-1.2086
	Entrance	- .0762	-2.3779	-1.2248
	Whitecourt	.3697	-1.6861	- .2694
	Athabasca	.9165	-1.8288	.4973
	MEAN	.4314	-1.7479	- .5285
	STANDARD DEVIATION	\pm .3355	\pm .3758	\pm .6491
12	Rochester	.3072	- .6598	- .3743
	Elk Point	1.1056	- .5968	- .6374
	MEAN	.7064	- .6283	- .5039
	STANDARD DEVIATION	\pm .5646	\pm .0445	\pm .1861
13	Ranfurly	1.0086	.6081	-1.5295
	Vegreville	.5862	.6633	-1.5952
	Ft. Saskatchewan	1.6146	1.0165	-1.2248
	Sion	.5094	.8072	- .9986
	MEAN	.9297	.7735	-1.3370
	STANDARD DEVIATION	\pm .5066	\pm .1825	\pm .2274

TABLE 5

Selected Seasonal Normals (1 May - 30 September)
1954 - 1968

GROUP NUMBER	TEMPERATURE (°F)			PRECIPITATION INCHES	DEGREE-DAYS (°F)			POTENTIAL EVAPOTRANSPIRATION INCHES	DAY LENGTH HOURS	FROST-FREE PERIOD DAYS	KILLING FROST- FREE PERIOD DAYS
	MEAN	MAXIMUM	MINIMUM		>28 x 100	>32 x 100	>42 x 100				
 1	52-54	64-66	42-44	12	40-42	34-36	18-20	18	15.3-15.4	100-120	120-140
 2	50-52	58-62	40-42	16-18	32-36	24-28	10-14	15-17	15.1-15.4	80-100	100-140
 3	52-54	64-66	40-42	10-12	38	32-34	16-18	17-18	15.4-15.5	80-120	120-140
 4	52-54	62-66	40-44	12-16	38-40	32-34	16-20	17-18	15.3-15.4	100-120	140-160
 5	54-56	66-70	42-44	10-14	40-44	34-38	20-22	18-20	15.1-15.2	80-120	120-140
 6	54-56	68-70	42-44	10-12	42-44	36-38	20-22	18-20	15.1-15.2	80-100	100-120
 7	54-56	64-68	44-46	10-12	38-42	34-36	20-22	18-20	15.4-15.5	100-120	120-140
 8	52-54	62-64	44-46	12-14	40-42	34-36	20-22	18-20	15.3-15.4	120-140	140-160
 9	54-56	66-68	42-46	10-12	40-42	34-38	20-22	18-20	15.3-15.4	80-120	120-140
 10	50-52	60-62	42-44	14-18	30-38	26-32	12-18	16-17	15.2-15.4	100-120	140-160
 11	52-54	64-66	38-42	12-16	38-40	32-34	18-20	17-18	15.1-15.4	60-100	100-120
 12	54-56	66-68	42-44	12-14	38-42	32-36	18-22	17-19	15.2-15.3	80-100	100-140
 13	54-58	66-70	42-46	10-12	40-46	34-38	18-24	18-19	15.1-15.2	100-120	120-160

SMOOTHED STATISTICAL CLIMATIC ZONES

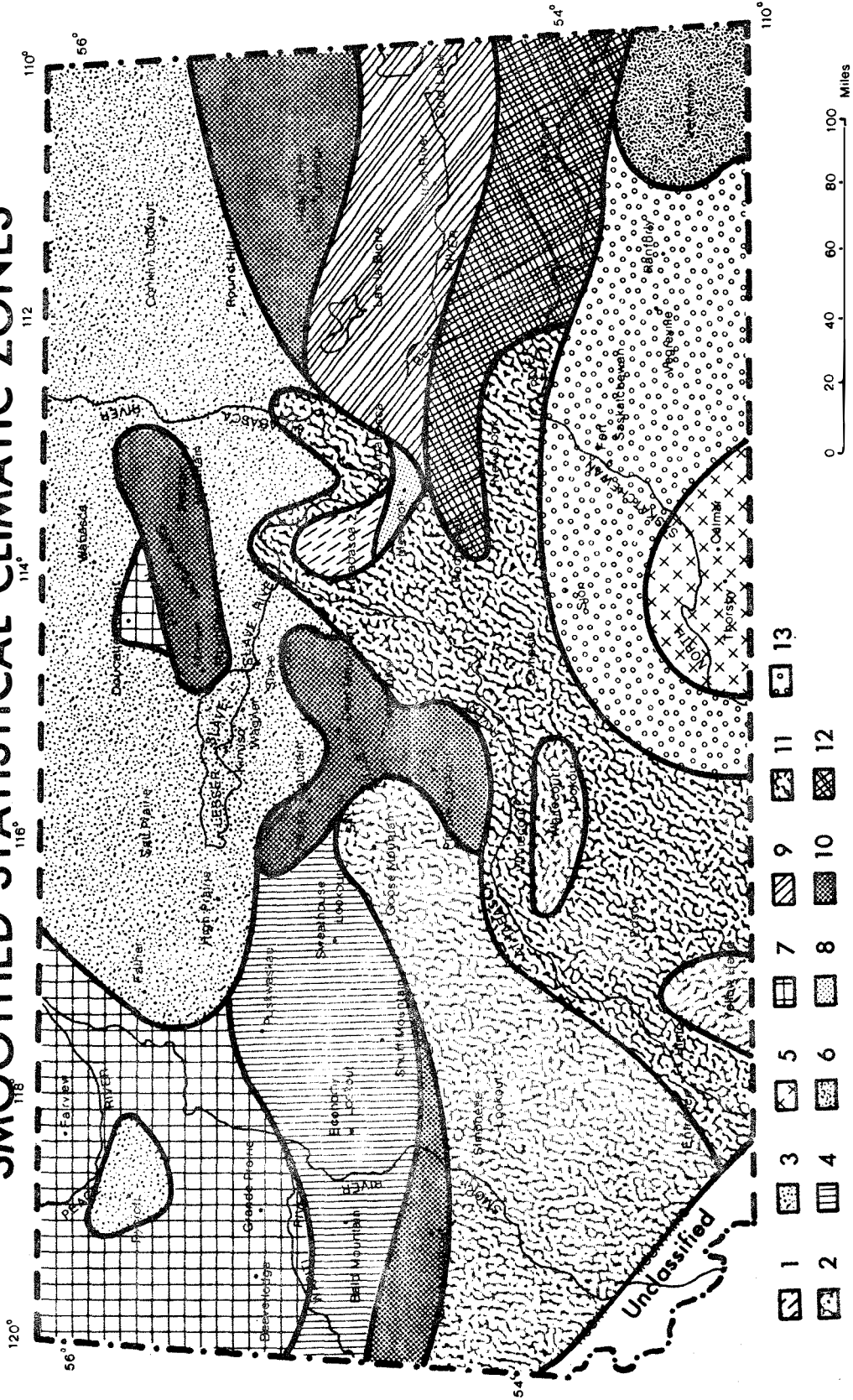


FIGURE 3

thermo dew-point traverses. Application of this technique will be described in a subsequent report.

An inspection of this climatic zonation map (Fig. 3) illustrates some interesting correlations. Stations such as Kakwa, House, Deer, Pimple, Martin, Pelican Mountains, Swan Dive and Heart Lake all appear as one climatic type. Each station is in forested regions at relatively higher elevations. However, other stations, Bald, Economy, Snuff, Sweathouse, and Puskwaskau occur at similar elevations in forested areas but are indicated as having a slightly different climate. Athabasca at 1700 feet is climatically similar to Hinton at 3325 feet; thus elevation is not always a unifying variable. Nor are climatic regions explained simply by mean temperature differences. June mean daily temperature at Wagner of 54.4°F and at Salt Prairie of 52.0°F places these within the same climatic type. The June mean daily temperature of 54.1°F at Snuff Mountain is, however, within a different climatic type. Likewise, the mean June precipitations of 2.8 inches at Wagner and 3.2 inches at Salt Prairie are in a climatically different area than the Snuff Mountain total of 3.4 inches. Possibly the distinguishing feature between these three stations is the frost-free period. Wagner and Salt Prairie have 100 and 96 days respectively, whereas Snuff Mountain has 129 days. But this difference does not hold for all stations. For example, Calmar has 109 days, yet compared to Wagner it is climatically different. Therefore, it is the inter-relationship among each of these 75 variables which accounts for the thirteen groupings of the 52 stations. Appendix A illustrates normals per month for each of the respective input variables based upon the

period between May and September from 1954-1968. Such normals for many of the forestry stations were not previously available, although Stashko (1971 a and b) has recently published probable 30-year May to September normal maximum temperatures and 8 year precipitation means for these stations.

Inherent in this technique of climatic associations are two basic assumptions, typical of most classification problems. Firstly, it is assumed that the data utilized adequately characterize the climate at each station included in the study, and that the data do not include inherent observational or reporting errors. Secondly, it is also assumed that the number of stations utilized and their distribution is adequate to represent the study area. Since the length of the climatic record at each station largely determined its inclusion in the study, this problem then became a matter of working with the available stations. However, another problem concerns the representativeness of each station. Mobile thermo dew point recording proved useful in both examining the representativeness of some stations and establishing general criteria for all stations within the study area. It is sufficient at this point to note that the climatic boundaries are smoothed or adjusted according to five general guidelines developed from the mobile traversing aspects of the study (MacIver, 1970).

This climatic classification technique is but a first step toward adequate macroclimatic zonation. Future work will include a study to reduce the number of input variables required for statistical analysis, and evaluation of other grouping procedures and an extension

of the technique to cover the complete forested areas of the Prairie Provinces. In this expanded study, a short, more recent time period will be employed, which will enable a denser network of stations to be used in many of the forested areas, especially Alberta.

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APPENDIX A

CLIMATIC DATA, 1954-1968

CLIMATIC REGION 1

ATHABASCA 2

ELEVATION 1900 FEET	LATITUDE 54 49					LONGITUDE 113 32					
	MAY	JUNE	JULY	AUG	SEPT	MAY	JUNE	JULY	AUG	SEPT	
MEAN TEMPERATURE (F)	48.6	55.1	58.3	58.3	48.9	PRECIPITATION (IN)	1.8	2.9	2.9	2.8	1.6
MAX. TEMPERATURE (F)	60.5	66.6	69.8	69.8	59.6	MIN. TEMPERATURE (F)	37.1	44.1	47.3	47.3	38.7
DAYS ABOVE 32F (DAYS)	23.	29.	30.	31.	24.	DAYS ABOVE 42F (DAYS)	8.	19.	27.	26.	9.
DAYS ABOVE 28F (DAYS)	28.	30.	30.	31.	27.	DEG DAYS ABOVE 28F (F)	645.	823.	968.	941.	627.
DEG DAYS ABOVE 32F (F)	525.	706.	849.	817.	508.	DEG DAYS ABOVE 42F (F)	244.	411.	555.	507.	233.
POT. EVAPOTRANS. (IN)	2.9	3.9	4.8	4.0	2.3	ACT. EVAPOTRANS. (IN)	2.9	3.7	3.5	3.0	1.8
WATER DEFICIENCY (IN)	0.0	0.2	1.3	1.0	0.5	DAY - LENGTH (HRS)	15.9	17.1	16.5	14.7	12.5
FROST-FREE PERIOD (DAYS)	110.					KILLING FROST-FREE PERIOD (DAYS)		133.			

CLIMATIC REGION 2

GOOSE MOUNTAIN LO.

ELEVATION 4500 FEET	LATITUDE 54 45					LONGITUDE 116 4					
	MAY	JUNE	JULY	AUG	SEPT	MAY	JUNE	JULY	AUG	SEPT	
MEAN TEMPERATURE (F)	42.5	48.6	53.5	51.3	43.1	PRECIPITATION (IN)	2.2	5.3	4.5	4.5	2.4
MAX. TEMPERATURE (F)	51.2	57.5	62.9	59.8	51.0	MIN. TEMPERATURE (F)	34.5	40.2	44.6	43.3	35.6
DAYS ABOVE 32F (DAYS)	19.	27.	31.	30.	21.	DAYS ABOVE 42F (DAYS)	3.	10.	20.	16.	6.
DAYS ABOVE 28F (DAYS)	26.	30.	31.	31.	26.	DEG DAYS ABOVE 28F (F)	454.	617.	790.	722.	457.
DEG DAYS ABOVE 32F (F)	336.	497.	666.	598.	341.	DEG DAYS ABOVE 42F (F)	96.	209.	357.	293.	105.
POT. EVAPOTRANS. (IN)	2.5	3.5	4.3	3.6	2.0	ACT. EVAPOTRANS. (IN)	2.5	3.5	4.1	3.4	2.0
WATER DEFICIENCY (IN)	0.0	0.0	0.2	0.2	0.0	DAY - LENGTH (HRS)	15.9	17.1	16.5	14.7	12.5
FROST-FREE PERIOD (DAYS)	82.					KILLING FROST-FREE PERIOD (DAYS)		114.			

SIMONETTE LOOKOUT

ELEVATION 4525 FEET	LATITUDE 54 14					LONGITUDE 118 25					
	MAY	JUNE	JULY	AUG	SEPT	MAY	JUNE	JULY	AUG	SEPT	
MEAN TEMPERATURE (F)	44.5	51.0	55.8	53.9	45.7	PRECIPITATION (IN)	1.7	3.9	3.7	4.4	2.8
MAX. TEMPERATURE (F)	54.0	60.7	65.9	63.8	54.8	MIN. TEMPERATURE (F)	35.5	41.8	46.2	44.6	37.1
DAYS ABOVE 32F (DAYS)	20.	29.	31.	30.	22.	DAYS ABOVE 42F (DAYS)	5.	13.	25.	21.	6.
DAYS ABOVE 28F (DAYS)	28.	30.	31.	31.	27.	DEG DAYS ABOVE 28F (F)	513.	690.	862.	804.	532.
DEG DAYS ABOVE 32F (F)	392.	570.	738.	680.	415.	DEG DAYS ABOVE 42F (F)	135.	275.	428.	372.	157.
POT. EVAPOTRANS. (IN)	2.6	3.6	4.4	3.8	2.2	ACT. EVAPOTRANS. (IN)	2.6	3.4	3.9	3.6	1.9
WATER DEFICIENCY (IN)	0.0	0.2	0.5	0.2	0.2	DAY - LENGTH (HRS)	15.8	17.0	16.4	14.6	12.5
FROST-FREE PERIOD (DAYS)	99.					KILLING FROST-FREE PERIOD (DAYS)		130.			

WHITEFORT LOOKOUT

ELEVATION 3800 FEET	LATITUDE 54 1					LONGITUDE 115 43					
	MAY	JUNE	JULY	AUG	SEPT	MAY	JUNE	JULY	AUG	SEPT	
MEAN TEMPERATURE (F)	47.9	49.5	52.7	51.9	45.2	PRECIPITATION (IN)	2.3	3.2	3.5	3.5	1.4
MAX. TEMPERATURE (F)	52.6	58.1	60.1	59.3	54.0	MIN. TEMPERATURE (F)	33.7	41.4	45.7	44.9	36.8
DAYS ABOVE 32F (DAYS)	17.	27.	30.	30.	20.	DAYS ABOVE 42F (DAYS)	4.	12.	21.	20.	9.
DAYS ABOVE 28F (DAYS)	23.	29.	31.	31.	24.	DEG DAYS ABOVE 28F (F)	465.	646.	764.	740.	516.
DEG DAYS ABOVE 32F (F)	344.	526.	640.	616.	399.	DEG DAYS ABOVE 42F (F)	98.	233.	331.	310.	152.
POT. EVAPOTRANS. (IN)	2.5	3.6	4.1	3.7	2.3	ACT. EVAPOTRANS. (IN)	2.5	3.6	3.8	3.0	1.8
WATER DEFICIENCY (IN)	0.0	0.0	0.3	0.7	0.5	DAY - LENGTH (HRS)	15.8	16.9	16.3	14.6	12.5
FROST-FREE PERIOD (DAYS)	92.					KILLING FROST-FREE PERIOD (DAYS)		115.			

YELLOWHEAD LOOKOUT

ELEVATION 4800 FEET	LATITUDE 53 14					LONGITUDE 117 8					
	MAY	JUNE	JULY	AUG	SEPT	MAY	JUNE	JULY	AUG	SEPT	
MEAN TEMPERATURE (F)	44.1	50.9	55.4	53.7	45.9	PRECIPITATION (IN)	3.0	4.0	3.7	3.7	2.7
MAX. TEMPERATURE (F)	53.4	60.9	66.5	63.7	55.1	MIN. TEMPERATURE (F)	35.3	41.5	44.8	44.2	37.2
DAYS ABOVE 32F (DAYS)	20.	29.	31.	31.	23.	DAYS ABOVE 42F (DAYS)	5.	13.	23.	19.	7.
DAYS ABOVE 28F (DAYS)	26.	30.	31.	31.	27.	DEG DAYS ABOVE 28F (F)	500.	688.	850.	797.	538.
DEG DAYS ABOVE 32F (F)	379.	568.	728.	673.	421.	DEG DAYS ABOVE 42F (F)	128.	272.	423.	365.	165.
POT. EVAPOTRANS. (IN)	2.4	3.6	4.4	3.7	2.2	ACT. EVAPOTRANS. (IN)	2.4	3.6	4.4	3.4	2.0
WATER DEFICIENCY (IN)	0.0	0.0	0.0	0.9	0.2	DAY - LENGTH (HRS)	15.7	16.5	16.2	14.5	12.5
FROST-FREE PERIOD (DAYS)	92.					KILLING FROST-FREE PERIOD (DAYS)		124.			

CLIMATIC REGION 3

CONKLIN LOOKOUT

ELEVATION 2200 FEET	LATITUDE 55 37					LONGITUDE 111 11					
	MAY	JUNE	JULY	AUG	SEPT	MAY	JUNE	JULY	AUG	SEPT	
MEAN TEMPERATURE (F)	46.9	53.1	56.8	56.6	47.4	PRECIPITATION (IN)	1.5	3.6	4.0	3.4	2.4
MAX. TEMPERATURE (F)	57.5	63.3	65.9	66.2	56.4	MIN. TEMPERATURE (F)	37.0	43.4	48.2	47.6	39.0
DAYS ABOVE 32F (DAYS)	23.	28.	29.	31.	24.	DAYS ABOVE 42F (DAYS)	9.	20.	28.	26.	10.
DAYS ABOVE 28F (DAYS)	27.	29.	29.	31.	28.	DEC DAYS ABOVE 28F (F)	595.	760.	906.	887.	583.
DEG DAYS ABOVE 32F (F)	477.	642.	787.	763.	466.	DEC DAYS ABOVE 42F (F)	210.	353.	495.	455.	202.
POT. EVAPOTRANS. (IN)	2.8	3.8	4.6	3.9	2.3	ACT. EVAPOTRANS. (IN)	2.8	3.6	4.2	3.1	1.9
WATER DEFICIENCY (IN)	0.0	0.2	0.4	0.8	0.4	DAY - LENGTH (HRS)	16.1	17.3	16.7	14.8	12.5
FROST-FREE PERIOD (DAYS)	104.					KILLING FR ST-FREE PERIOD (DAYS)		131.			

FALHER

ELEVATION 1910 FEET	LATITUDE 55 45					LONGITUDE 117 12					
	MAY	JUNE	JULY	AUG	SEPT	MAY	JUNE	JULY	AUG	SEPT	
MEAN TEMPERATURE (F)	48.6	55.5	59.3	57.1	48.7	PRECIPITATION (IN)	1.8	1.9	2.9	2.8	1.2
MAX. TEMPERATURE (F)	60.5	67.6	71.8	68.8	59.8	MIN. TEMPERATURE (F)	37.2	43.9	47.2	45.9	38.1
DAYS ABOVE 32F (DAYS)	23.	30.	31.	31.	24.	DAYS ABOVE 42F (DAYS)	7.	18.	25.	23.	8.
DAYS ABOVE 28F (DAYS)	28.	30.	31.	31.	27.	DEC DAYS ABOVE 28F (F)	640.	825.	969.	902.	621.
DEG DAYS ABOVE 32F (F)	518.	705.	845.	779.	502.	DEC DAYS ABOVE 42F (F)	231.	405.	535.	470.	225.
POT. EVAPOTRANS. (IN)	2.8	4.0	4.5	3.9	2.4	ACT. EVAPOTRANS. (IN)	2.8	3.6	3.1	2.6	1.5
WATER DEFICIENCY (IN)	0.0	0.4	1.4	1.3	0.9	DAY - LENGTH (HRS)	16.1	17.3	16.7	14.8	12.5
FROST-FREE PERIOD (DAYS)	111.					KILLING FROST-FREE PERIOD (DAYS)		133.			

HIGH PRAIRIE RS.

ELEVATION 1958 FEET	LATITUDE 55 25					LONGITUDE 116 29					
	MAY	JUNE	JULY	AUG	SEPT	MAY	JUNE	JULY	AUG	SEPT	
MEAN TEMPERATURE (F)	48.7	54.4	59.3	57.5	49.2	PRECIPITATION (IN)	1.1	2.8	2.5	2.3	1.2
MAX. TEMPERATURE (F)	61.3	68.0	71.8	69.6	61.0	MIN. TEMPERATURE (F)	36.5	41.3	47.2	45.9	37.9
DAYS ABOVE 32F (DAYS)	21.	28.	30.	31.	23.	DAYS ABOVE 42F (DAYS)	7.	17.	25.	23.	8.
DAYS ABOVE 28F (DAYS)	26.	28.	30.	31.	26.	DEC DAYS ABOVE 28F (F)	643.	793.	975.	915.	636.
DEG DAYS ABOVE 32F (F)	521.	674.	853.	791.	517.	DEC DAYS ABOVE 42F (F)	238.	389.	549.	484.	242.
POT. EVAPOTRANS. (IN)	3.0	3.8	4.5	4.0	2.4	ACT. EVAPOTRANS. (IN)	3.0	3.3	3.1	2.6	1.4
WATER DEFICIENCY (IN)	0.0	0.5	1.4	1.4	1.0	DAY - LENGTH (HRS)	16.0	17.2	16.6	14.8	12.5
FROST-FREE PERIOD (DAYS)	96.					KILLING FROST-FREE PERIOD (DAYS)		129.			

KINUSO

ELEVATION 1928 FEET	LATITUDE 55 20					LONGITUDE 115 26					
	MAY	JUNE	JULY	AUG	SEPT	MAY	JUNE	JULY	AUG	SEPT	
MEAN TEMPERATURE (F)	48.1	53.8	58.0	56.6	45.5	PRECIPITATION (IN)	0.6	1.9	2.7	2.2	1.3
MAX. TEMPERATURE (F)	61.3	67.7	71.2	69.1	61.0	MIN. TEMPERATURE (F)	35.5	40.4	45.4	44.5	34.5
DAYS ABOVE 32F (DAYS)	20.	27.	30.	31.	22.	DAYS ABOVE 42F (DAYS)	6.	15.	24.	22.	6.
DAYS ABOVE 28F (DAYS)	25.	28.	30.	31.	26.	DEC DAYS ABOVE 28F (F)	676.	774.	936.	886.	619.
DEG DAYS ABOVE 32F (F)	505.	655.	814.	763.	500.	DEC DAYS ABOVE 42F (F)	222.	367.	510.	455.	225.
POT. EVAPOTRANS. (IN)	2.9	3.8	4.5	4.1	2.4	ACT. EVAPOTRANS. (IN)	2.9	3.0	3.2	2.2	1.3
WATER DEFICIENCY (IN)	0.0	0.8	1.3	1.9	1.1	DAY - LENGTH (HRS)	16.0	17.2	16.6	14.7	12.5
FROST-FREE PERIOD (DAYS)	93.					KILLING FROST-FREE PERIOD (DAYS)		122.			

ROUND HILL LOOKOUT

ELEVATION 2460 FEET	LATITUDE 55 18					LONGITUDE 111 58					
	MAY	JUNE	JULY	AUG	SEPT	MAY	JUNE	JULY	AUG	SEPT	
MEAN TEMPERATURE (F)	46.0	51.7	54.4	55.3	46.4	PRECIPITATION (IN)	1.5	2.9	3.8	3.4	1.8
MAX. TEMPERATURE (F)	57.7	63.0	64.4	66.9	57.3	MIN. TEMPERATURE (F)	34.7	40.8	44.8	44.2	36.0
DAYS ABOVE 32F (DAYS)	20.	28.	30.	30.	22.	DAYS ABOVE 42F (DAYS)	6.	14.	24.	21.	6.
DAYS ABOVE 28F (DAYS)	25.	29.	30.	31.	25.	DEC DAYS ABOVE 28F (F)	577.	735.	873.	849.	553.
DEG DAYS ABOVE 32F (F)	460.	619.	757.	725.	435.	DEC DAYS ABOVE 42F (F)	193.	331.	469.	417.	176.
POT. EVAPOTRANS. (IN)	2.7	3.6	4.4	3.8	2.2	ACT. EVAPOTRANS. (IN)	2.7	3.3	3.6	3.0	1.8
WATER DEFICIENCY (IN)	0.0	1.3	0.8	0.8	0.4	DAY - LENGTH (HRS)	16.0	17.2	16.6	14.7	12.5
FROST-FREE PERIOD (DAYS)	96.					KILLING FROST-FREE PERIOD (DAYS)		118.			

RYCROFT

ELEVATION 1983 FEET	LATITUDE 55 46					LONGITUDE 118 38					
	MAY	JUNE	JULY	AUG	SEPT	MAY	JUNE	JULY	AUG	SEPT	
MEAN TEMPERATURE (F)	49.1	56.1	60.4	58.5	49.3	PRECIPITATION (IN)	1.3	2.3	2.5	2.0	1.0
MAX. TEMPERATURE (F)	62.2	69.1	73.5	71.5	61.7	MIN. TEMPERATURE (F)	36.5	43.6	47.7	46.0	37.3
DAYS ABOVE 32F (DAYS)	22.	29.	31.	30.	22.	DAYS ABOVE 42F (DAYS)	7.	17.	26.	23.	9.
DAYS ABOVE 28F (DAYS)	26.	30.	31.	31.	26.	DEG DAYS ABOVE 28F (F)	655.	844.	1003.	946.	639.
DEG DAYS ABOVE 32F (F)	533.	724.	879.	822.	519.	DEG DAYS ABOVE 42F (F)	248.	424.	569.	513.	242.
POT. EVAPOTRANS. (IN)	2.9	4.0	4.6	4.0	2.4	ACT. EVAPOTRANS. (IN)	2.9	3.3	3.0	2.0	1.2
WATER DEFICIENCY (IN)	0.0	0.7	1.6	2.0	1.2	DAY - LENGTH (HRS)	16.1	17.3	16.7	14.8	12.5
FROST-FREE PERIOD (DAYS)	94.					KILLING FROST-FREE PERIOD (DAYS)		114.			

SALT PRAIRIE LOOKOUT

ELEVATION 2350 FEET	LATITUDE 55 40					LONGITUDE 115 50					
	MAY	JUNE	JULY	AUG	SEPT	MAY	JUNE	JULY	AUG	SEPT	
MEAN TEMPERATURE (F)	45.8	52.0	56.6	53.9	43.3	PRECIPITATION (IN)	1.4	3.2	4.0	2.9	1.3
MAX. TEMPERATURE (F)	56.9	63.3	68.2	64.9	53.8	MIN. TEMPERATURE (F)	35.3	41.3	45.5	43.5	35.8
DAYS ABOVE 32F (DAYS)	21.	28.	31.	31.	22.	DAYS ABOVE 42F (DAYS)	5.	11.	20.	17.	5.
DAYS ABOVE 28F (DAYS)	27.	30.	31.	31.	26.	DEG DAYS ABOVE 28F (F)	554.	722.	887.	805.	534.
DEG DAYS ABOVE 32F (F)	433.	602.	763.	681.	418.	DEG DAYS ABOVE 42F (F)	167.	307.	453.	375.	161.
POT. EVAPOTRANS. (IN)	2.8	3.8	4.4	3.7	2.2	ACT. EVAPOTRANS. (IN)	2.8	3.4	3.4	2.9	1.4
WATER DEFICIENCY (IN)	0.0	0.4	1.0	0.8	0.8	DAY - LENGTH (HRS)	16.1	17.3	16.7	14.8	12.5
FROST-FREE PERIOD (DAYS)	96.					KILLING FROST-FREE PERIOD (DAYS)		130.			

SLAVE LAKE

ELEVATION 1920 FEET	LATITUDE 55 17					LONGITUDE 114 46					
	MAY	JUNE	JULY	AUG	SEPT	MAY	JUNE	JULY	AUG	SEPT	
MEAN TEMPERATURE (F)	47.8	53.7	58.2	56.9	48.7	PRECIPITATION (IN)	1.8	3.5	2.6	2.1	1.8
MAX. TEMPERATURE (F)	60.8	67.2	70.4	68.8	56.1	MIN. TEMPERATURE (F)	35.4	40.7	46.5	45.6	37.8
DAYS ABOVE 32F (DAYS)	20.	27.	30.	31.	23.	DAYS ABOVE 42F (DAYS)	5.	16.	25.	22.	8.
DAYS ABOVE 28F (DAYS)	26.	28.	30.	31.	27.	DEG DAYS ABOVE 28F (F)	617.	772.	942.	896.	621.
DEG DAYS ABOVE 32F (F)	495.	653.	820.	772.	502.	DEG DAYS ABOVE 42F (F)	210.	367.	517.	463.	224.
POT. EVAPOTRANS. (IN)	2.8	4.0	4.7	4.0	2.3	ACT. EVAPOTRANS. (IN)	2.8	3.9	3.9	2.6	1.9
WATER DEFICIENCY (IN)	0.0	0.1	0.8	1.4	0.4	DAY - LENGTH (HRS)	16.0	17.2	16.6	14.7	12.5
FROST-FREE PERIOD (DAYS)	100.					KILLING FROST-FREE PERIOD (DAYS)		132.			

WABASCA RS

ELEVATION 1787 FEET	LATITUDE 55 58					LONGITUDE 113 50					
	MAY	JUNE	JULY	AUG	SEPT	MAY	JUNE	JULY	AUG	SEPT	
MEAN TEMPERATURE (F)	48.7	55.1	59.7	58.1	46.1	PRECIPITATION (IN)	1.8	2.2	2.9	1.4	1.0
MAX. TEMPERATURE (F)	60.8	67.6	70.9	68.9	60.3	MIN. TEMPERATURE (F)	37.3	43.2	49.1	47.7	36.6
DAYS ABOVE 32F (DAYS)	22.	28.	30.	31.	24.	DAYS ABOVE 42F (DAYS)	9.	19.	27.	25.	10.
DAYS ABOVE 28F (DAYS)	26.	28.	30.	31.	27.	DEG DAYS ABOVE 28F (F)	646.	813.	988.	933.	638.
DEG DAYS ABOVE 32F (F)	524.	694.	866.	810.	519.	DEG DAYS ABOVE 42F (F)	243.	403.	562.	501.	244.
POT. EVAPOTRANS. (IN)	2.9	4.0	4.8	4.2	2.4	ACT. EVAPOTRANS. (IN)	2.9	3.8	3.2	1.8	1.0
WATER DEFICIENCY (IN)	0.0	0.2	1.6	2.4	1.4	DAY - LENGTH (HRS)	16.1	17.3	16.8	14.8	12.5
FROST-FREE PERIOD (DAYS)	105.					KILLING FROST-FREE PERIOD (DAYS)		132.			

WAGNER

ELEVATION 1915 FEET	LATITUDE 55 21					LONGITUDE 114 59					
	MAY	JUNE	JULY	AUG	SEPT	MAY	JUNE	JULY	AUG	SEPT	
MEAN TEMPERATURE (F)	46.7	54.4	59.9	57.8	48.7	PRECIPITATION (IN)	1.7	2.8	3.0	2.6	1.5
MAX. TEMPERATURE (F)	58.7	65.5	70.7	68.3	58.7	MIN. TEMPERATURE (F)	35.1	43.9	49.6	47.7	39.3
DAYS ABOVE 32F (DAYS)	20.	29.	31.	31.	24.	DAYS ABOVE 42F (DAYS)	5.	17.	28.	26.	9.
DAYS ABOVE 28F (DAYS)	25.	30.	31.	31.	28.	DEG DAYS ABOVE 28F (F)	580.	792.	990.	923.	622.
DEG DAYS ABOVE 32F (F)	459.	672.	866.	799.	503.	DEG DAYS ABOVE 42F (F)	184.	372.	556.	489.	224.
POT. EVAPOTRANS. (IN)	2.7	3.9	4.7	4.0	2.4	ACT. EVAPOTRANS. (IN)	2.7	3.7	3.6	2.9	1.5
WATER DEFICIENCY (IN)	0.0	0.2	1.1	1.1	0.9	DAY - LENGTH (HRS)	16.0	17.2	16.6	14.7	12.5
FROST-FREE PERIOD (DAYS)	100.					KILLING FROST-FREE PERIOD (DAYS)		132.			

CLIMATIC REGION 4

BAID MOUNTAIN LOOKOUT

ELEVATION 3150 FEET	LATITUDE 54 48					LONGITUDE 118 54					
	MAY	JUNE	JULY	AUG	SEPT		MAY	JUNE	JULY	AUG	SEPT
MEAN TEMPERATURE (F)	47.7	54.8	59.2	57.3	48.4	PRECIPITATION (IN)	2.3	3.6	2.8	3.6	2.1
MAX. TEMPERATURE (F)	57.0	63.9	68.6	66.4	57.4	MIN. TEMPERATURE (F)	38.8	46.1	50.4	48.7	39.9
DAYS ABOVE 32F (DAYS)	25.	30.	31.	31.	25.	DAYS ABOVE 42F (DAYS)	10.	22.	29.	27.	11.
DAYS ABOVE 28F (DAYS)	29.	30.	31.	31.	28.	DEG DAYS ABOVE 28F (F)	611.	504.	968.	908.	612.
DEG DAYS ABOVE 32F (F)	488.	684.	844.	784.	494.	DEG DAYS ABOVE 42F (F)	209.	384.	534.	475.	221.
POT. EVAPOTRANS. (IN)	2.8	3.9	4.6	3.9	2.3	ACT. EVAPOTRANS. (IN)	2.8	3.9	3.3	3.3	1.9
WATER DEFICIENCY (IN)	0.0	0.0	1.3	0.6	0.4	DAY - LENGTH (HRS)	15.9	17.1	16.5	14.7	12.5
FROST-FREE PERIOD (DAYS)	121.					KILLING FROST-FREE PERIOD (DAYS)		146.			

ECONOMY LOOKOUT

ELEVATION 2800 FEET	LATITUDE 54 47					LONGITUDE 118 14					
	MAY	JUNE	JULY	AUG	SEPT		MAY	JUNE	JULY	AUG	SEPT
MEAN TEMPERATURE (F)	48.3	54.7	59.0	57.2	49.1	PRECIPITATION (IN)	2.2	3.5	3.4	3.4	1.9
MAX. TEMPERATURE (F)	58.7	65.1	69.8	67.5	59.0	MIN. TEMPERATURE (F)	38.4	44.9	48.8	47.4	39.7
DAYS ABOVE 32F (DAYS)	25.	30.	31.	31.	25.	DAYS ABOVE 42F (DAYS)	9.	20.	29.	26.	11.
DAYS ABOVE 28F (DAYS)	29.	30.	31.	31.	28.	DEG DAYS ABOVE 28F (F)	631.	802.	962.	905.	635.
DEG DAYS ABOVE 32F (F)	509.	682.	838.	781.	516.	DEG DAYS ABOVE 42F (F)	225.	383.	528.	471.	240.
POT. EVAPOTRANS. (IN)	2.9	3.9	4.5	3.9	2.4	ACT. EVAPOTRANS. (IN)	2.9	3.8	3.9	3.3	1.9
WATER DEFICIENCY (IN)	0.0	0.1	0.6	0.6	0.5	DAY - LENGTH (HRS)	15.9	17.1	16.5	14.7	12.5
FROST-FREE PERIOD (DAYS)	126.					KILLING FROST-FREE PERIOD (DAYS)		146.			

PUSKJASKAU

ELEVATION 2950 FEET	LATITUDE 55 13					LONGITUDE 117 29					
	MAY	JUNE	JULY	AUG	SEPT		MAY	JUNE	JULY	AUG	SEPT
MEAN TEMPERATURE (F)	48.4	54.4	58.4	56.4	46.8	PRECIPITATION (IN)	1.9	3.4	3.1	3.1	1.4
MAX. TEMPERATURE (F)	57.5	63.8	68.3	65.5	54.7	MIN. TEMPERATURE (F)	39.8	45.4	48.9	47.8	39.5
DAYS ABOVE 32F (DAYS)	26.	30.	31.	31.	26.	DAYS ABOVE 42F (DAYS)	10.	21.	28.	26.	12.
DAYS ABOVE 28F (DAYS)	30.	30.	31.	31.	29.	DEG DAYS ABOVE 28F (F)	633.	791.	941.	881.	623.
DEG DAYS ABOVE 32F (F)	511.	671.	817.	757.	505.	DEG DAYS ABOVE 42F (F)	228.	373.	507.	449.	231.
POT. EVAPOTRANS. (IN)	2.9	3.9	4.5	3.8	2.4	ACT. EVAPOTRANS. (IN)	2.9	3.5	3.8	3.1	1.8
WATER DEFICIENCY (IN)	0.1	0.4	0.7	0.7	0.6	DAY - LENGTH (HRS)	16.0	17.2	16.6	14.7	12.5
FROST-FREE PERIOD (DAYS)	122.					KILLING FROST-FREE PERIOD (DAYS)		153.			

SNUFF MOUNTAIN LOOK.

ELEVATION 3050 FEET	LATITUDE 54 40					LONGITUDE 117 32					
	MAY	JUNE	JULY	AUG	SEPT		MAY	JUNE	JULY	AUG	SEPT
MEAN TEMPERATURE (F)	47.6	54.1	58.2	56.6	48.2	PRECIPITATION (IN)	2.3	3.4	2.9	3.1	1.8
MAX. TEMPERATURE (F)	56.4	62.7	66.9	65.1	56.8	MIN. TEMPERATURE (F)	39.2	46.1	50.0	48.6	40.2
DAYS ABOVE 32F (DAYS)	26.	30.	31.	31.	26.	DAYS ABOVE 42F (DAYS)	11.	22.	29.	28.	12.
DAYS ABOVE 28F (DAYS)	30.	30.	31.	31.	28.	DEG DAYS ABOVE 28F (F)	607.	785.	935.	886.	608.
DEG DAYS ABOVE 32F (F)	485.	665.	811.	762.	490.	DEG DAYS ABOVE 42F (F)	206.	365.	501.	452.	217.
POT. EVAPOTRANS. (IN)	2.8	3.9	4.5	3.9	2.3	ACT. EVAPOTRANS. (IN)	2.8	3.5	3.8	3.0	1.7
WATER DEFICIENCY (IN)	0.0	0.4	0.7	0.9	0.6	DAY - LENGTH (HRS)	15.9	17.1	16.5	14.7	12.5
FROST-FREE PERIOD (DAYS)	129.					KILLING FROST-FREE PERIOD (DAYS)		151.			

SWATHOUSE LOOKOUT

ELEVATION 2900 FEET	LATITUDE 54 55					LONGITUDE 116 45					
	MAY	JUNE	JULY	AUG	SEPT		MAY	JUNE	JULY	AUG	SEPT
MEAN TEMPERATURE (F)	48.3	54.2	58.4	56.3	48.4	PRECIPITATION (IN)	2.2	3.3	4.1	3.7	1.8
MAX. TEMPERATURE (F)	58.3	64.7	69.6	66.6	57.7	MIN. TEMPERATURE (F)	38.8	44.2	47.7	46.5	39.6
DAYS ABOVE 32F (DAYS)	26.	30.	31.	31.	26.	DAYS ABOVE 42F (DAYS)	9.	20.	27.	25.	11.
DAYS ABOVE 28F (DAYS)	30.	30.	31.	31.	28.	DEG DAYS ABOVE 28F (F)	632.	786.	942.	877.	612.
DEG DAYS ABOVE 32F (F)	509.	666.	818.	753.	494.	DEG DAYS ABOVE 42F (F)	224.	367.	508.	444.	219.
POT. EVAPOTRANS. (IN)	2.9	3.8	4.5	3.8	2.3	ACT. EVAPOTRANS. (IN)	2.9	3.6	3.9	3.3	2.1
WATER DEFICIENCY (IN)	0.2	0.2	0.6	0.5	0.2	DAY - LENGTH (HRS)	15.9	17.1	16.5	14.7	12.5
FROST-FREE PERIOD (DAYS)	121.					KILLING FROST-FREE PERIOD (DAYS)		151.			

CLIMATIC REGION 5

CALMAR

ELEVATION 2200 FEET	LATITUDE 53 15					LONGITUDE 113 50					
	MAY	JUNE	JULY	AUG	SEPT	MAY	JUNE	JULY	AUG	SEPT	
MEAN TEMPERATURE (F)	50.0	56.8	61.4	59.0	50.3	PRECIPITATION (IN)	1.6	2.5	2.5	2.6	1.5
MAX. TEMPERATURE (F)	63.3	69.5	74.5	71.7	62.7	MIN. TEMPERATURE (F)	37.1	44.7	48.9	46.9	38.5
DAYS ABOVE 32F (DAYS)	23.	30.	31.	31.	26.	DAYS ABOVE 42F (DAYS)	8.	19.	27.	25.	8.
DAYS ABOVE 28F (DAYS)	28.	30.	31.	31.	28.	DEG DAYS ABOVE 28F (F)	681.	864.	1037.	962.	670.
DEG DAYS ABOVE 32F (F)	559.	744.	913.	838.	551.	DEG DAYS ABOVE 42F (F)	267.	444.	603.	529.	269.
POT. EVAPOTRANS. (IN)	3.0	4.1	4.8	4.1	2.4	ACT. EVAPOTRANS. (IN)	3.0	3.5	3.1	2.5	1.4
WATER DEFICIENCY (IN)	0.0	0.6	1.7	1.6	1.0	DAY - LENGTH (HRS)	15.7	16.5	16.2	14.5	12.5
FROST-FREE PERIOD (DAYS)	109.					KILLING FROST-FREE PERIOD (DAYS)		134.			

THORSBY

ELEVATION 2450 FEET	LATITUDE 53 14					LONGITUDE 114 2					
	MAY	JUNE	JULY	AUG	SEPT	MAY	JUNE	JULY	AUG	SEPT	
MEAN TEMPERATURE (F)	49.8	56.1	60.5	58.3	49.6	PRECIPITATION (IN)	2.0	2.5	2.8	2.8	2.3
MAX. TEMPERATURE (F)	62.7	68.5	71.6	70.9	61.6	MIN. TEMPERATURE (F)	37.5	44.2	48.0	46.2	38.2
DAYS ABOVE 32F (DAYS)	24.	30.	31.	31.	24.	DAYS ABOVE 42F (DAYS)	8.	21.	28.	25.	9.
DAYS ABOVE 28F (DAYS)	28.	30.	31.	31.	27.	DEG DAYS ABOVE 28F (F)	678.	844.	1008.	939.	650.
DEG DAYS ABOVE 32F (F)	555.	724.	884.	815.	531.	DEG DAYS ABOVE 42F (F)	266.	424.	574.	505.	254.
POT. EVAPOTRANS. (IN)	3.0	3.9	4.7	4.0	2.4	ACT. EVAPOTRANS. (IN)	3.0	3.6	3.5	2.3	2.0
WATER DEFICIENCY (IN)	0.0	0.3	1.2	1.7	0.4	DAY - LENGTH (HRS)	15.7	16.5	16.2	14.5	12.5
FROST-FREE PERIOD (DAYS)	99.					KILLING FROST-FREE PERIOD (DAYS)		133.			

CLIMATIC REGION 6

VERMILION A

ELEVATION 2037 FEET	LATITUDE 53 21					LONGITUDE 110 50					
	MAY	JUNE	JULY	AUG	SEPT	MAY	JUNE	JULY	AUG	SEPT	
MEAN TEMPERATURE (F)	49.7	56.8	62.0	59.4	49.6	PRECIPITATION (IN)	1.4	2.7	2.1	3.1	1.5
MAX. TEMPERATURE (F)	63.2	69.4	75.1	72.0	61.7	MIN. TEMPERATURE (F)	36.8	44.7	49.3	47.4	38.0
DAYS ABOVE 32F (DAYS)	22.	29.	31.	31.	23.	DAYS ABOVE 42F (DAYS)	7.	20.	27.	25.	9.
DAYS ABOVE 28F (DAYS)	26.	30.	31.	31.	27.	DEG DAYS ABOVE 28F (F)	674.	865.	1053.	975.	648.
DEG DAYS ABOVE 32F (F)	552.	745.	929.	851.	530.	DEG DAYS ABOVE 42F (F)	265.	445.	619.	541.	254.
POT. EVAPOTRANS. (IN)	3.0	4.1	4.8	4.1	2.3	ACT. EVAPOTRANS. (IN)	3.0	3.6	3.1	2.9	1.4
WATER DEFICIENCY (IN)	0.0	0.5	1.7	1.2	0.9	DAY - LENGTH (HRS)	15.7	16.6	16.2	14.5	12.5
FROST-FREE PERIOD (DAYS)	94.					KILLING FROST-FREE PERIOD (DAYS)		119.			

CLIMATIC REGION 7

BLAVERLODGE

ELEVATION 2500 FEET	LATITUDE 55 11					LONGITUDE 119 22					
	MAY	JUNE	JULY	AUG	SEPT	MAY	JUNE	JULY	AUG	SEPT	
MEAN TEMPERATURE (F)	48.1	55.1	59.6	57.7	49.1	PRECIPITATION (IN)	1.6	2.9	2.4	2.6	1.3
MAX. TEMPERATURE (F)	59.5	66.7	71.6	69.5	60.0	MIN. TEMPERATURE (F)	37.1	44.0	48.0	46.4	38.6
DAYS ABOVE 32F (DAYS)	23.	30.	31.	31.	24.	DAYS ABOVE 42F (DAYS)	8.	18.	27.	23.	9.
DAYS ABOVE 28F (DAYS)	28.	30.	31.	31.	27.	DEG DAYS ABOVE 28F (F)	624.	812.	979.	921.	632.
DEG DAYS ABOVE 32F (F)	502.	692.	855.	797.	514.	DEG DAYS ABOVE 42F (F)	220.	392.	546.	487.	236.
POT. EVAPOTRANS. (IN)	2.8	3.9	4.6	4.0	2.4	ACT. EVAPOTRANS. (IN)	2.8	3.7	3.2	2.4	1.3
WATER DEFICIENCY (IN)	0.0	0.2	1.4	2.6	1.1	DAY - LENGTH (HRS)	16.0	17.2	16.6	14.7	12.5
FROST-FREE PERIOD (DAYS)	110.					KILLING FROST-FREE PERIOD (DAYS)		135.			

DOUCETTE LOOKOUT

ELEVATION 2000 FEET	LATITUDE 55 49					LONGITUDE 114 18					
	MAY	JUNE	JULY	AUG	SEPT	MAY	JUNE	JULY	AUG	SEPT	
MEAN TEMPERATURE (F)	48.3	55.4	59.8	57.1	45.9	PRECIPITATION (IN)	2.0	3.1	4.2	3.0	1.4
MAX. TEMPERATURE (F)	59.1	66.1	70.9	67.5	56.2	MIN. TEMPERATURE (F)	37.9	45.2	49.1	47.2	38.7
DAYS ABOVE 32F (DAYS)	23.	30.	31.	31.	24.	DAYS ABOVE 42F (DAYS)	10.	21.	29.	26.	10.
DAYS ABOVE 28F (DAYS)	28.	30.	31.	31.	27.	DEG DAYS ABOVE 28F (F)	630.	823.	984.	901.	615.
DEG DAYS ABOVE 32F (F)	510.	703.	860.	777.	497.	DEG DAYS ABOVE 42F (F)	232.	404.	550.	469.	227.
POT. EVAPOTRANS. (IN)	2.8	4.0	4.7	3.9	2.3	ACT. EVAPOTRANS. (IN)	2.8	3.7	4.5	3.2	1.7
WATER DEFICIENCY (IN)	0.0	0.3	0.2	0.7	0.5	DAY - LENGTH (HRS)	16.1	17.3	16.7	14.8	12.5
FROST-FREE PERIOD (DAYS)	109.					KILLING FROST-FREE PERIOD (DAYS)		135.			

GRANDE PRAIRIE A

	ELEVATION 2190 FEET					LATITUDE 55 11					LONGITUDE 116 53				
	MAY	JUNE	JULY	AUG	SEPT	MAY	JUNE	JULY	AUG	SEPT					
MEAN TEMPERATURE (F)	49.2	56.3	60.9	58.9	49.7	PRECIPITATION (IN)	1.5	3.0	2.4	2.4	1.2				
MAX. TEMPERATURE (F)	60.9	67.9	72.5	70.5	61.1	MIN. TEMPERATURE (F)	38.0	45.3	49.7	47.7	38.7				
DAYS ABOVE 32F (DAYS)	24.	30.	31.	31.	25.	DAYS ABOVE 42F (DAYS)	8.	21.	29.	26.	9.				
DAYS ABOVE 28F (DAYS)	29.	30.	31.	31.	27.	DEG DAYS ABOVE 28F (F)	657.	850.	1018.	956.	650.				
DEG DAYS ABOVE 32F (F)	535.	730.	894.	832.	531.	DEG DAYS ABOVE 42F (F)	247.	430.	584.	522.	252.				
POT. EVAPOTRANS. (IN)	2.9	4.0	4.7	4.0	2.4	ACT. EVAPOTRANS. (IN)	2.9	3.7	3.3	2.6	1.2				
WATER DEFICIENCY (IN)	0.0	0.3	0.6	1.4	1.2	DAY - LENGTH (HRS)	16.0	17.2	16.6	14.7	12.5				
FROST-FREE PERIOD (DAYS)	120.					KILLING FROST-FREE PERIOD (DAYS)		139.							

FAIRVIEW

	ELEVATION 2160 FEET					LATITUDE 56 4					LONGITUDE 116 23				
	MAY	JUNE	JULY	AUG	SEPT	MAY	JUNE	JULY	AUG	SEPT					
MEAN TEMPERATURE (F)	49.6	56.9	61.2	59.0	49.8	PRECIPITATION (IN)	1.5	2.4	3.0	1.9	0.9				
MAX. TEMPERATURE (F)	60.8	68.2	72.5	70.1	60.4	MIN. TEMPERATURE (F)	38.8	46.1	50.4	48.3	39.5				
DAYS ABOVE 32F (DAYS)	25.	30.	31.	31.	25.	DAYS ABOVE 42F (DAYS)	9.	22.	30.	27.	11.				
DAYS ABOVE 28F (DAYS)	29.	30.	31.	31.	28.	DEG DAYS ABOVE 28F (F)	669.	866.	1029.	960.	652.				
DEG DAYS ABOVE 32F (F)	567.	746.	905.	836.	533.	DEG DAYS ABOVE 42F (F)	259.	446.	595.	526.	256.				
POT. EVAPOTRANS. (IN)	2.9	4.1	4.8	4.0	2.3	ACT. EVAPOTRANS. (IN)	2.9	3.5	3.5	2.1	1.2				
WATER DEFICIENCY (IN)	0.0	0.6	1.3	1.9	1.1	DAY - LENGTH (HRS)	16.2	17.3	16.8	14.8	12.5				
FROST-FREE PERIOD (DAYS)	122.					KILLING FROST-FREE PERIOD (DAYS)		146.							

CLIMATIC REGION 8

MEANOK

	ELEVATION 2250 FEET					LATITUDE 54 37					LONGITUDE 113 21				
	MAY	JUNE	JULY	AUG	SEPT	MAY	JUNE	JULY	AUG	SEPT					
MEAN TEMPERATURE (F)	48.5	54.4	58.1	59.2	49.8	PRECIPITATION (IN)	1.8	3.2	2.8	3.1	1.8				
MAX. TEMPERATURE (F)	58.7	64.4	67.3	69.2	58.8	MIN. TEMPERATURE (F)	38.7	45.0	49.3	49.8	41.3				
DAYS ABOVE 32D (DAYS)	25.	29.	29.	31.	26.	DAYS ABOVE 42F (DAYS)	12.	23.	29.	28.	15.				
DAYS ABOVE 28F (DAYS)	28.	29.	29.	31.	28.	DEG DAYS ABOVE 28F (F)	654.	819.	972.	970.	655.				
DEG DAYS ABOVE 32F (F)	536.	704.	856.	866.	536.	DEG DAYS ABOVE 42F (F)	260.	418.	568.	537.	260.				
POT. EVAPOTRANS. (IN)	2.8	3.8	4.7	4.1	2.4	ACT. EVAPOTRANS. (IN)	2.8	3.6	3.7	3.2	1.7				
WATER DEFICIENCY (IN)	0.0	0.2	1.0	0.9	0.7	DAY - LENGTH (HRS)	15.9	17.1	16.5	14.7	12.5				
FROST-FREE PERIOD (DAYS)	121.					KILLING FROST-FREE PERIOD (DAYS)		148.							

CLIMATIC REGION 9

COLD LAKE A

	ELEVATION 1784 FEET					LATITUDE 54 25					LONGITUDE 110 17				
	MAY	JUNE	JULY	AUG	SEPT	MAY	JUNE	JULY	AUG	SEPT					
MEAN TEMPERATURE (F)	49.8	57.6	62.7	59.8	49.6	PRECIPITATION (IN)	1.5	2.7	3.2	3.0	1.7				
MAX. TEMPERATURE (F)	61.6	68.9	73.7	70.5	60.1	MIN. TEMPERATURE (F)	38.4	46.8	52.0	49.7	39.7				
DAYS ABOVE 32F (DAYS)	25.	30.	31.	31.	25.	DAYS ABOVE 42F (DAYS)	9.	23.	30.	28.	11.				
DAYS ABOVE 28F (DAYS)	28.	30.	31.	31.	28.	DEG DAYS ABOVE 28F (F)	676.	868.	1074.	987.	649.				
DEG DAYS ABOVE 32F (F)	543.	748.	950.	863.	530.	DEG DAYS ABOVE 42F (F)	260.	468.	640.	553.	253.				
POT. EVAPOTRANS. (IN)	2.9	4.2	4.9	4.1	2.3	ACT. EVAPOTRANS. (IN)	2.9	3.8	3.6	2.8	1.6				
WATER DEFICIENCY (IN)	0.0	0.6	1.3	1.3	0.7	DAY - LENGTH (HRS)	15.9	17.0	16.4	14.6	12.5				
FROST-FREE PERIOD (DAYS)	98.					KILLING FROST-FREE PERIOD (DAYS)		137.							

IRON RIVER

	ELEVATION 1900 FEET					LATITUDE 54 25					LONGITUDE 111 0				
	MAY	JUNE	JULY	AUG	SEPT	MAY	JUNE	JULY	AUG	SEPT					
MEAN TEMPERATURE (F)	49.5	56.9	62.1	59.1	49.3	PRECIPITATION (IN)	1.6	2.6	2.9	2.6	1.6				
MAX. TEMPERATURE (F)	62.7	69.3	74.4	71.4	61.1	MIN. TEMPERATURE (F)	37.0	44.9	50.3	47.2	37.9				
DAYS ABOVE 32F (DAYS)	23.	30.	31.	31.	23.	DAYS ABOVE 42F (DAYS)	8.	21.	29.	25.	8.				
DAYS ABOVE 28F (DAYS)	26.	30.	31.	31.	27.	DEG DAYS ABOVE 28F (F)	668.	866.	1057.	964.	638.				
DEG DAYS ABOVE 32F (F)	566.	746.	933.	840.	519.	DEG DAYS ABOVE 42F (F)	257.	446.	623.	530.	241.				
POT. EVAPOTRANS. (IN)	3.0	4.0	4.9	4.0	2.3	ACT. EVAPOTRANS. (IN)	3.0	3.4	3.4	2.5	1.6				
WATER DEFICIENCY (IN)	0.0	0.6	1.5	1.5	0.7	DAY - LENGTH (HRS)	15.9	17.0	16.4	14.6	12.5				
FROST-FREE PERIOD (DAYS)	104.					KILLING FROST-FREE PERIOD (DAYS)		127.							

LAC LA BICHE

ELEVATION 1835 FEET	LATITUDE 54 46					LONGITUDE 111 58					
	MAY	JUNE	JULY	AUG	SEPT	MAY	JUNE	JULY	AUG	SEPT	
MEAN TEMPERATURE (F)	49.1	56.6	61.7	59.3	47.3	PRECIPITATION (IN)	1.5	2.7	3.2	2.9	1.9
MAX. TEMPERATURE (F)	61.1	68.2	73.1	70.5	59.9	MIN. TEMPERATURE (F)	37.5	45.5	50.8	48.6	39.1
DAYS ABOVE 32F (DAYS)	23.	29.	31.	31.	24.	DAYS ABOVE 42F (DAYS)	8.	21.	29.	26.	10.
DAYS ABOVE 28F (DAYS)	27.	30.	31.	31.	28.	DEG DAYS ABOVE 28F (F)	663.	864.	1066.	973.	649.
DEG DAYS ABOVE 32F (F)	54.1	74.4	94.2	84.9	52.9	DEG DAYS ABOVE 42F (F)	258.	444.	632.	539.	252.
POT. EVAPOTRANS. (IN)	2.9	4.1	4.8	4.1	2.3	ACT. EVAPOTRANS. (IN)	2.9	3.6	3.8	2.8	1.7
WATER DEFICIENCY (IN)	0.0	0.5	1.0	1.3	0.6	DAY - LENGTH (HRS)	15.9	17.1	16.5	14.7	12.5
FROST-FREE PERIOD (DAYS)	104.					KILLING FROST-FREE PERIOD (DAYS)		134.			

CLIMATIC REGION 10

DEER MOUNTAIN LOOKOUT

ELEVATION 3680 FEET	LATITUDE 54 55					LONGITUDE 115 9					
	MAY	JUNE	JULY	AUG	SEPT	MAY	JUNE	JULY	AUG	SEPT	
MEAN TEMPERATURE (F)	45.8	52.8	57.2	55.0	46.8	PRECIPITATION (IN)	3.2	3.7	4.6	4.3	2.0
MAX. TEMPERATURE (F)	54.9	62.0	67.0	63.9	54.7	MIN. TEMPERATURE (F)	37.3	44.1	47.8	46.6	39.4
DAYS ABOVE 32F (DAYS)	23.	29.	31.	31.	25.	DAYS ABOVE 42F (DAYS)	8.	19.	27.	25.	11.
DAYS ABOVE 28F (DAYS)	28.	30.	31.	31.	28.	DEG DAYS ABOVE 28F (F)	555.	743.	904.	837.	565.
DEG DAYS ABOVE 32F (F)	436.	623.	780.	713.	447.	DEG DAYS ABOVE 42F (F)	169.	326.	470.	404.	185.
POT. EVAPOTRANS. (IN)	2.4	3.7	4.4	3.8	2.3	ACT. EVAPOTRANS. (IN)	2.4	3.7	4.2	3.4	2.0
WATER DEFICIENCY (IN)	0.0	0.0	0.2	0.4	0.3	DAY - LENGTH (HRS)	15.9	17.1	16.5	14.7	12.5
FROST-FREE PERIOD (DAYS)	109.					KILLING FROST-FREE PERIOD (DAYS)		140.			

HOISE MOUNTAIN LO.

ELEVATION 3850 FEET	LATITUDE 55 2					LONGITUDE 115 36					
	MAY	JUNE	JULY	AUG	SEPT	MAY	JUNE	JULY	AUG	SEPT	
MEAN TEMPERATURE (F)	46.3	52.8	57.1	55.0	46.7	PRECIPITATION (IN)	2.5	4.3	4.2	3.9	2.1
MAX. TEMPERATURE (F)	55.2	62.0	66.9	63.7	54.5	MIN. TEMPERATURE (F)	37.9	44.3	47.9	46.7	39.3
DAYS ABOVE 32F (DAYS)	24.	29.	31.	31.	24.	DAYS ABOVE 42F (DAYS)	9.	20.	27.	24.	10.
DAYS ABOVE 28F (DAYS)	28.	30.	31.	31.	28.	DEG DAYS ABOVE 28F (F)	568.	745.	904.	835.	562.
DEG DAYS ABOVE 32F (F)	447.	625.	780.	711.	444.	DEG DAYS ABOVE 42F (F)	176.	328.	470.	403.	181.
POT. EVAPOTRANS. (IN)	2.6	3.8	4.4	3.8	2.2	ACT. EVAPOTRANS. (IN)	2.6	3.8	4.3	3.4	1.9
WATER DEFICIENCY (IN)	0.0	0.0	0.1	0.4	0.3	DAY - LENGTH (HRS)	15.9	17.1	16.5	14.7	12.5
FROST-FREE PERIOD (DAYS)	104.					KILLING FROST-FREE PERIOD (DAYS)		141.			

HEART LAKE LOOKOUT

ELEVATION 2910 FEET	LATITUDE 55 0					LONGITUDE 111 20					
	MAY	JUNE	JULY	AUG	SEPT	MAY	JUNE	JULY	AUG	SEPT	
MEAN TEMPERATURE (F)	46.1	52.9	57.1	56.1	46.5	PRECIPITATION (IN)	2.1	3.9	4.4	3.9	3.0
MAX. TEMPERATURE (F)	56.0	62.2	66.0	64.7	54.6	MIN. TEMPERATURE (F)	36.7	44.1	48.7	48.0	38.9
DAYS ABOVE 32F (DAYS)	22.	28.	29.	31.	23.	DAYS ABOVE 42F (DAYS)	8.	20.	28.	26.	10.
DAYS ABOVE 28F (DAYS)	26.	29.	29.	31.	27.	DEG DAYS ABOVE 28F (F)	562.	747.	902.	872.	555.
DEG DAYS ABOVE 32F (F)	443.	628.	781.	748.	438.	DEG DAYS ABOVE 42F (F)	184.	337.	485.	440.	186.
POT. EVAPOTRANS. (IN)	2.7	3.8	4.4	3.9	2.2	ACT. EVAPOTRANS. (IN)	2.7	3.8	4.1	3.6	1.9
WATER DEFICIENCY (IN)	0.0	0.0	0.3	0.3	0.3	DAY - LENGTH (HRS)	15.9	17.1	16.5	14.7	12.5
FROST-FREE PERIOD (DAYS)	105.					KILLING FROST-FREE PERIOD (DAYS)		126.			

KAVUA LOOKOUT

ELEVATION 4050 FEET	LATITUDE 54 25					LONGITUDE 118 58					
	MAY	JUNE	JULY	AUG	SEPT	MAY	JUNE	JULY	AUG	SEPT	
MEAN TEMPERATURE (F)	45.1	51.8	56.5	54.7	46.3	PRECIPITATION (IN)	2.7	4.3	3.2	4.0	2.2
MAX. TEMPERATURE (F)	54.7	61.6	66.7	64.6	55.7	MIN. TEMPERATURE (F)	36.0	42.5	46.8	45.3	37.3
DAYS ABOVE 32F (DAYS)	22.	30.	31.	31.	24.	DAYS ABOVE 42F (DAYS)	5.	15.	26.	23.	7.
DAYS ABOVE 28F (DAYS)	28.	30.	31.	31.	27.	DEG DAYS ABOVE 28F (F)	533.	715.	885.	828.	550.
DEG DAYS ABOVE 32F (F)	412.	595.	761.	704.	433.	DEG DAYS ABOVE 42F (F)	151.	297.	451.	396.	172.
POT. EVAPOTRANS. (IN)	2.7	3.7	4.4	3.8	2.3	ACT. EVAPOTRANS. (IN)	2.7	3.7	4.1	3.0	1.9
WATER DEFICIENCY (IN)	0.0	0.0	0.3	0.8	0.4	DAY - LENGTH (HRS)	15.9	17.0	16.4	14.6	12.5
FROST-FREE PERIOD (DAYS)	103.					KILLING FROST-FREE PERIOD (DAYS)		134.			

MARTEN MOUNTAIN LO.

ELEVATION 3150 FEET	LATITUDE 55 29					LONGITUDE 114 41					
	MAY	JUNE	JULY	AUG	SEPT	MAY	JUNE	JULY	AUG	SEPT	
MEAN TEMPERATURE (F)	45.9	52.8	57.1	54.7	46.3	PRECIPITATION (IN)	1.9	3.8	4.1	3.6	1.9
MAX. TEMPERATURE (F)	54.5	60.8	65.0	62.0	53.7	MIN. TEMPERATURE (F)	37.7	45.4	49.6	47.9	39.4
DAYS ABOVE 32F (DAYS)	23.	30.	31.	31.	24.	DAYS ABOVE 42F (DAYS)	9.	21.	29.	27.	10.
DAYS ABOVE 28F (DAYS)	27.	30.	31.	31.	27.	DEG DAYS ABOVE 28F (F)	556.	746.	902.	829.	550.
DEG DAYS ABOVE 32F (F)	436.	626.	778.	705.	432.	DEG DAYS ABOVE 42F (F)	172.	329.	468.	398.	175.
POT. EVAPOTRANS. (IN)	2.6	3.8	4.5	3.8	2.2	ACT. EVAPOTRANS. (IN)	2.6	3.7	4.3	3.2	1.9
WATER DEFICIENCY (IN)	0.0	0.1	0.2	0.6	0.2	DAY - LENGTH (HRS)	16.0	17.2	16.7	14.8	12.5
FROST-FREE PERIOD (DAYS)	110.					KILLING FROST-FREE PERIOD (DAYS)		134.			

PELICAN MOUNTAIN LO.

ELEVATION 3000 FEET	LATITUDE 55 37					LONGITUDE 113 34					
	MAY	JUNE	JULY	AUG	SEPT	MAY	JUNE	JULY	AUG	SEPT	
MEAN TEMPERATURE (F)	47.1	53.6	58.1	55.2	44.9	PRECIPITATION (IN)	2.5	4.1	3.9	3.1	2.3
MAX. TEMPERATURE (F)	56.7	63.4	68.3	64.8	53.6	MIN. TEMPERATURE (F)	38.0	44.2	48.4	46.1	36.7
DAYS ABOVE 32F (DAYS)	29.	30.	31.	31.	24.	DAYS ABOVE 42F (DAYS)	8.	19.	28.	25.	9.
DAYS ABOVE 28F (DAYS)	29.	30.	31.	31.	27.	DEG DAYS ABOVE 28F (F)	593.	767.	933.	843.	574.
DEG DAYS ABOVE 32F (F)	471.	647.	809.	720.	456.	DEG DAYS ABOVE 42F (F)	198.	350.	499.	413.	196.
POT. EVAPOTRANS. (IN)	2.8	3.8	4.5	3.8	2.3	ACT. EVAPOTRANS. (IN)	2.8	3.6	4.2	3.1	1.9
WATER DEFICIENCY (IN)	0.0	0.2	0.3	0.7	0.4	DAY - LENGTH (HRS)	16.1	17.3	16.7	14.8	12.5
FROST-FREE PERIOD (DAYS)	110.					KILLING FROST-FREE PERIOD (DAYS)		141.			

PIMPLE LOOKOUT

ELEVATION 3619 FEET	LATITUDE 54 29					LONGITUDE 115 27					
	MAY	JUNE	JULY	AUG	SEPT	MAY	JUNE	JULY	AUG	SEPT	
MEAN TEMPERATURE (F)	46.3	52.2	56.7	54.6	46.7	PRECIPITATION (IN)	2.1	3.6	3.7	3.3	1.2
MAX. TEMPERATURE (F)	55.0	61.2	66.2	63.3	54.6	MIN. TEMPERATURE (F)	38.0	43.8	47.7	46.3	39.3
DAYS ABOVE 32F (DAYS)	25.	30.	31.	31.	25.	DAYS ABOVE 42F (DAYS)	8.	18.	26.	24.	10.
DAYS ABOVE 28F (DAYS)	29.	30.	31.	31.	28.	DEG DAYS ABOVE 28F (F)	568.	727.	890.	824.	562.
DEG DAYS ABOVE 32F (F)	446.	607.	766.	700.	444.	DEG DAYS ABOVE 42F (F)	171.	309.	456.	391.	177.
POT. EVAPOTRANS. (IN)	2.7	3.7	4.4	3.8	2.2	ACT. EVAPOTRANS. (IN)	2.7	3.6	3.9	3.2	1.8
WATER DEFICIENCY (IN)	0.0	0.1	0.5	0.6	0.9	DAY - LENGTH (HRS)	15.9	17.0	16.4	14.7	12.5
FROST-FREE PERIOD (DAYS)	112.					KILLING FROST-FREE PERIOD (DAYS)		143.			

SWAN DIVE LOOKOUT

ELEVATION 4174 FEET	LATITUDE 54 43					LONGITUDE 115 13					
	MAY	JUNE	JULY	AUG	SEPT	MAY	JUNE	JULY	AUG	SEPT	
MEAN TEMPERATURE (F)	45.7	52.5	57.4	55.1	46.2	PRECIPITATION (IN)	2.5	3.5	4.4	3.8	1.7
MAX. TEMPERATURE (F)	54.2	61.7	66.9	63.6	54.0	MIN. TEMPERATURE (F)	37.7	43.8	48.4	47.0	38.8
DAYS ABOVE 32F (DAYS)	25.	29.	31.	31.	24.	DAYS ABOVE 42F (DAYS)	8.	18.	27.	25.	10.
DAYS ABOVE 28F (DAYS)	28.	30.	31.	31.	27.	DEG DAYS ABOVE 28F (F)	548.	736.	913.	839.	548.
DEG DAYS ABOVE 32F (F)	428.	616.	789.	715.	431.	DEG DAYS ABOVE 42F (F)	166.	319.	479.	406.	177.
POT. EVAPOTRANS. (IN)	2.6	3.8	4.4	3.8	2.2	ACT. EVAPOTRANS. (IN)	2.6	3.6	4.2	3.1	1.8
WATER DEFICIENCY (IN)	0.0	0.2	0.2	0.7	0.3	DAY - LENGTH (HRS)	15.9	17.1	16.5	14.7	12.5
FROST-FREE PERIOD (DAYS)	104.					KILLING FROST-FREE PERIOD (DAYS)		144.			

CLIMATIC REGION 11

ATHABASCA

ELEVATION 1700 FEET	LATITUDE 54 43					LONGITUDE 113 17					
	MAY	JUNE	JULY	AUG	SEPT	MAY	JUNE	JULY	AUG	SEPT	
MEAN TEMPERATURE (F)	48.3	54.6	60.2	58.0	48.8	PRECIPITATION (IN)	2.2	2.9	3.0	3.1	1.5
MAX. TEMPERATURE (F)	62.8	69.6	75.2	72.3	62.0	MIN. TEMPERATURE (F)	34.3	40.1	45.7	44.2	36.0
DAYS ABOVE 32F (DAYS)	18.	27.	31.	31.	21.	DAYS ABOVE 42F (DAYS)	4.	10.	22.	19.	6.
DAYS ABOVE 28F (DAYS)	24.	29.	31.	31.	27.	DEG DAYS ABOVE 28F (F)	631.	805.	998.	929.	623.
DEG DAYS ABOVE 32F (F)	509.	687.	874.	805.	504.	DEG DAYS ABOVE 42F (F)	225.	392.	565.	495.	227.
POT. EVAPOTRANS. (IN)	2.9	3.9	4.7	4.0	2.3	ACT. EVAPOTRANS. (IN)	2.9	3.5	3.4	3.1	1.6
WATER DEFICIENCY (IN)	0.0	0.4	1.3	0.9	0.7	DAY - LENGTH (HRS)	15.9	17.1	16.5	14.7	12.5
FROST-FREE PERIOD (DAYS)	83.					KILLING FROST-FREE PERIOD (DAYS)		115.			

CAMPSIE

ELEVATION 2200 FEET	LATITUDE 54 8					LONGITUDE 114 41					
	MAY	JUNE	JULY	AUG	SEPT	MAY	JUNE	JULY	AUG	SEPT	
MEAN TEMPERATURE (F)	48.8	55.5	60.2	57.6	48.9	PRECIPITATION (IN)	1.6	3.2	2.9	3.2	1.2
MAX. TEMPERATURE (F)	62.5	68.7	73.5	70.5	61.7	MIN. TEMPERATURE (F)	35.7	42.8	47.5	45.1	36.6
DAYS ABOVE 32F (DAYS)	20.	28.	31.	30.	21.	DAYS ABOVE 42F (DAYS)	6.	17.	24.	21.	7.
DAYS ABOVE 28F (DAYS)	25.	30.	31.	31.	26.	DEG DAYS ABOVE 28F (F)	645.	825.	1001.	920.	628.
DEG DAYS ABOVE 32F (F)	523.	705.	878.	797.	508.	DEG DAYS ABOVE 42F (F)	235.	406.	569.	483.	229.
POT. EVAPOTRANS. (IN)	2.9	4.0	4.7	3.9	2.3	ACT. EVAPOTRANS. (IN)	2.9	3.7	3.8	2.9	1.5
WATER DEFICIENCY (IN)	0.0	0.3	0.9	1.0	0.8	DAY - LENGTH (HRS)	15.8	16.9	16.3	14.6	12.5
FROST-FREE PERIOD (DAYS)	74.					KILLING FROST-FREE PERIOD (DAYS)		113.			

EDSON

ELEVATION 3033 FEET	LATITUDE 53 35					LONGITUDE 116 25					
	MAY	JUNE	JULY	AUG	SEPT	MAY	JUNE	JULY	AUG	SEPT	
MEAN TEMPERATURE (F)	47.0	54.0	58.5	56.6	48.3	PRECIPITATION (IN)	2.3	3.2	4.1	3.1	1.7
MAX. TEMPERATURE (F)	60.3	67.4	72.8	70.1	61.5	MIN. TEMPERATURE (F)	34.2	41.1	44.7	43.6	35.6
DAYS ABOVE 32F (DAYS)	18.	27.	30.	30.	21.	DAYS ABOVE 42F (DAYS)	4.	13.	22.	16.	5.
DAYS ABOVE 28F (DAYS)	25.	30.	31.	31.	25.	DEG DAYS ABOVE 28F (F)	584.	790.	975.	917.	627.
DEG DAYS ABOVE 32F (F)	461.	670.	851.	793.	508.	DEG DAYS ABOVE 42F (F)	180.	371.	541.	483.	229.
POT. EVAPOTRANS. (IN)	2.8	3.8	4.5	3.9	2.3	ACT. EVAPOTRANS. (IN)	2.8	3.8	4.2	3.4	1.9
WATER DEFICIENCY (IN)	0.0	0.0	0.3	0.5	0.4	DAY - LENGTH (HRS)	15.8	16.8	16.2	14.6	12.5
FROST-FREE PERIOD (DAYS)	71.					KILLING FROST-FREE PERIOD (DAYS)		113.			

ENTRANCE

ELEVATION 3225 FEET	LATITUDE 53 22					LONGITUDE 117 43					
	MAY	JUNE	JULY	AUG	SEPT	MAY	JUNE	JULY	AUG	SEPT	
MEAN TEMPERATURE (F)	46.2	53.0	57.4	55.8	47.5	PRECIPITATION (IN)	2.2	3.3	2.6	3.3	1.7
MAX. TEMPERATURE (F)	59.8	66.6	72.3	70.4	61.2	MIN. TEMPERATURE (F)	33.1	39.8	43.0	41.7	34.3
DAYS ABOVE 32F (DAYS)	16.	27.	30.	30.	18.	DAYS ABOVE 42F (DAYS)	2.	9.	17.	12.	4.
DAYS ABOVE 28F (DAYS)	24.	30.	31.	31.	25.	DEG DAYS ABOVE 28F (F)	565.	750.	912.	862.	586.
DEG DAYS ABOVE 32F (F)	443.	630.	788.	738.	467.	DEG DAYS ABOVE 42F (F)	165.	330.	481.	429.	193.
POT. EVAPOTRANS. (IN)	2.7	3.8	4.5	3.8	2.4	ACT. EVAPOTRANS. (IN)	2.7	3.5	3.8	2.9	1.7
WATER DEFICIENCY (IN)	0.0	0.3	0.7	0.9	0.7	DAY - LENGTH (HRS)	15.7	16.7	16.2	14.5	12.5
FROST-FREE PERIOD (DAYS)	59.					KILLING FROST-FREE PERIOD (DAYS)		112.			

HINSON

ELEVATION 3325 FEET	LATITUDE 53 24					LONGITUDE 117 33					
	MAY	JUNE	JULY	AUG	SEPT	MAY	JUNE	JULY	AUG	SEPT	
MEAN TEMPERATURE (F)	46.9	53.8	58.2	56.4	48.4	PRECIPITATION (IN)	2.5	3.8	2.9	3.5	1.6
MAX. TEMPERATURE (F)	60.5	67.8	73.2	70.7	61.7	MIN. TEMPERATURE (F)	33.7	40.2	43.7	42.7	35.6
DAYS ABOVE 32F (DAYS)	16.	27.	30.	30.	19.	DAYS ABOVE 42F (DAYS)	4.	11.	19.	16.	5.
DAYS ABOVE 28F (DAYS)	24.	30.	31.	31.	26.	DEG DAYS ABOVE 28F (F)	585.	773.	937.	881.	612.
DEG DAYS ABOVE 32F (F)	462.	653.	813.	757.	493.	DEG DAYS ABOVE 42F (F)	181.	353.	506.	448.	217.
POT. EVAPOTRANS. (IN)	2.7	3.8	4.5	3.9	2.3	ACT. EVAPOTRANS. (IN)	2.7	3.8	3.8	2.8	1.6
WATER DEFICIENCY (IN)	0.0	0.0	0.7	0.9	0.7	DAY - LENGTH (HRS)	15.7	16.7	16.2	14.5	12.5
FROST-FREE PERIOD (DAYS)	60.					KILLING FROST-FREE PERIOD (DAYS)		114.			

MILWBROOK

ELEVATION 2700 FEET	LATITUDE 54 20					LONGITUDE 112 57					
	MAY	JUNE	JULY	AUG	SEPT	MAY	JUNE	JULY	AUG	SEPT	
MEAN TEMPERATURE (F)	48.0	54.4	58.2	57.1	47.9	PRECIPITATION (IN)	1.4	2.7	2.7	2.8	1.7
MAX. TEMPERATURE (F)	61.2	67.3	70.7	70.2	60.1	MIN. TEMPERATURE (F)	35.3	42.1	46.3	44.6	36.2
DAYS ABOVE 32F (DAYS)	20.	28.	31.	30.	20.	DAYS ABOVE 42F (DAYS)	6.	14.	23.	19.	6.
DAYS ABOVE 28F (DAYS)	26.	30.	31.	31.	26.	DEG DAYS ABOVE 28F (F)	624.	798.	947.	904.	597.
DEG DAYS ABOVE 32F (F)	503.	679.	826.	780.	479.	DEG DAYS ABOVE 42F (F)	221.	382.	525.	470.	208.
POT. EVAPOTRANS. (IN)	2.9	3.9	4.6	3.9	2.3	ACT. EVAPOTRANS. (IN)	2.9	3.6	3.2	2.8	1.6
WATER DEFICIENCY (IN)	0.0	0.3	1.4	0.9	0.7	DAY - LENGTH (HRS)	15.8	17.0	16.4	14.6	12.5
FROST-FREE PERIOD (DAYS)	75.					KILLING FROST-FREE PERIOD (DAYS)		114.			

WHITECOURT

	LATITUDE 54 8					LONGITUDE 115 40				
	MAY	JUNE	JULY	AUG	SEPT	MAY	JUNE	JULY	AUG	SEPT
ELEVATION 2430 FEET										
MEAN TEMPERATURE (F)	47.4	54.3	59.2	56.7	47.9	PRECIPITATION (IN)	2.2	3.3	3.5	3.5
MAX. TEMPERATURE (F)	61.0	67.6	72.8	69.6	60.6	MIN. TEMPERATURE (F)	34.3	41.4	46.2	44.3
DAYS ABOVE 32F (DAYS)	18.	27.	31.	30.	20.	DAYS ABOVE 42F (DAYS)	5.	13.	23.	19.
DAYS ABOVE 28F (DAYS)	24.	29.	31.	31.	25.	DEG DAYS ABOVE 28F (F)	604.	789.	968.	890.
DEG DAYS ABOVE 32F (F)	482.	669.	844.	766.	479.	DEG DAYS ABOVE 42F (F)	199.	370.	534.	456.
POT. EVAPOTRANS. (IN)	2.8	3.9	4.6	3.9	2.3	ACT. EVAPOTRANS. (IN)	2.8	3.9	4.0	3.3
WATER DEFICIENCY (IN)	0.0	0.0	0.6	1.6	0.7	DAY - LENGTH (HRS)	15.8	16.9	16.3	14.6
FROST-FREE PERIOD (DAYS)	77.					KILLING FROST-FREE PERIOD (DAYS)		106.		

CLIMATIC REGION 12

ELK POINT

	LATITUDE 53 53					LONGITUDE 110 54				
	MAY	JUNE	JULY	AUG	SEPT	MAY	JUNE	JULY	AUG	SEPT
ELEVATION 1920 FEET										
MEAN TEMPERATURE (F)	49.0	56.8	61.6	58.9	49.0	PRECIPITATION (IN)	1.5	2.9	2.9	2.9
MAX. TEMPERATURE (F)	62.2	69.5	74.4	71.5	61.1	MIN. TEMPERATURE (F)	36.4	44.5	49.4	46.9
DAYS ABOVE 32F (DAYS)	21.	29.	31.	31.	22.	DAYS ABOVE 42F (DAYS)	7.	18.	26.	24.
DAYS ABOVE 28F (DAYS)	26.	30.	31.	31.	26.	DEG DAYS ABOVE 28F (F)	656.	863.	1043.	959.
DEG DAYS ABOVE 32F (F)	514.	743.	920.	835.	513.	DEG DAYS ABOVE 42F (F)	252.	444.	610.	525.
POT. EVAPOTRANS. (IN)	2.9	4.0	4.8	4.1	2.4	ACT. EVAPOTRANS. (IN)	2.9	3.5	3.7	2.8
WATER DEFICIENCY (IN)	0.0	0.5	0.9	1.3	0.6	DAY - LENGTH (HRS)	15.8	16.9	16.3	14.6
FROST-FREE PERIOD (DAYS)	98.					KILLING FROST-FREE PERIOD (DAYS)		118.		

ROCHESTER

	LATITUDE 54 22					LONGITUDE 113 21				
	MAY	JUNE	JULY	AUG	SEPT	MAY	JUNE	JULY	AUG	SEPT
ELEVATION 2050 FEET										
MEAN TEMPERATURE (F)	48.7	54.1	57.1	57.4	48.3	PRECIPITATION (IN)	1.7	2.7	2.8	2.8
MAX. TEMPERATURE (F)	61.3	66.4	69.4	69.7	60.4	MIN. TEMPERATURE (F)	36.6	42.2	45.2	45.5
DAYS ABOVE 32F (DAYS)	22.	28.	29.	31.	22.	DAYS ABOVE 42F (DAYS)	7.	15.	23.	21.
DAYS ABOVE 28F (DAYS)	27.	29.	30.	31.	26.	DEG DAYS ABOVE 28F (F)	645.	798.	936.	911.
DEG DAYS ABOVE 32F (F)	524.	681.	818.	787.	493.	DEG DAYS ABOVE 42F (F)	239.	388.	523.	478.
POT. EVAPOTRANS. (IN)	3.0	3.9	4.7	3.9	2.3	ACT. EVAPOTRANS. (IN)	3.0	3.4	3.6	2.8
WATER DEFICIENCY (IN)	0.0	0.5	1.1	1.1	0.9	DAY - LENGTH (HRS)	15.8	17.0	16.4	14.6
FROST-FREE PERIOD (DAYS)	82.					KILLING FROST-FREE PERIOD (DAYS)		122.		

CLIMATIC REGION 13

FORT SASKATCHEWAN

	LATITUDE 53 43					LONGITUDE 113 10				
	MAY	JUNE	JULY	AUG	SEPT	MAY	JUNE	JULY	AUG	SEPT
ELEVATION 2050 FEET										
MEAN TEMPERATURE (F)	51.3	58.1	62.9	60.6	51.2	PRECIPITATION (IN)	1.5	2.9	2.2	2.7
MAX. TEMPERATURE (F)	63.7	69.9	75.3	72.2	62.4	MIN. TEMPERATURE (F)	39.4	46.9	51.0	49.4
DAYS ABOVE 32F (DAYS)	25.	30.	31.	31.	26.	DAYS ABOVE 42F (DAYS)	11.	23.	29.	27.
DAYS ABOVE 28F (DAYS)	29.	30.	31.	31.	29.	DEG DAYS ABOVE 28F (F)	723.	904.	1082.	1010.
DEG DAYS ABOVE 32F (F)	600.	784.	958.	886.	576.	DEG DAYS ABOVE 42F (F)	307.	484.	648.	576.
POT. EVAPOTRANS. (IN)	3.0	4.2	4.9	4.2	2.4	ACT. EVAPOTRANS. (IN)	3.0	3.4	3.1	2.4
WATER DEFICIENCY (IN)	0.0	0.8	1.8	1.8	0.6	DAY - LENGTH (HRS)	15.8	16.8	16.2	14.6
FROST-FREE PERIOD (DAYS)	116.					KILLING FROST-FREE PERIOD (DAYS)		142.		

RANFURLY

	LATITUDE 53 27					LONGITUDE 111 39				
	MAY	JUNE	JULY	AUG	SEPT	MAY	JUNE	JULY	AUG	SEPT
ELEVATION 2250 FEET										
MEAN TEMPERATURE (F)	50.0	57.0	61.9	59.5	49.7	PRECIPITATION (IN)	1.4	2.7	3.0	3.1
MAX. TEMPERATURE (F)	62.3	68.6	73.9	70.9	60.6	MIN. TEMPERATURE (F)	38.1	45.8	50.5	48.5
DAYS ABOVE 32F (DAYS)	24.	30.	31.	31.	24.	DAYS ABOVE 42F (DAYS)	9.	22.	29.	27.
DAYS ABOVE 28F (DAYS)	28.	30.	31.	31.	28.	DEG DAYS ABOVE 28F (F)	682.	869.	1052.	976.
DEG DAYS ABOVE 32F (F)	560.	749.	928.	852.	533.	DEG DAYS ABOVE 42F (F)	272.	449.	618.	542.
POT. EVAPOTRANS. (IN)	3.0	4.1	4.8	4.1	2.4	ACT. EVAPOTRANS. (IN)	3.0	3.6	3.5	3.0
WATER DEFICIENCY (IN)	0.0	0.5	1.3	1.1	0.7	DAY - LENGTH (HRS)	15.7	16.7	16.2	14.5
FROST-FREE PERIOD (DAYS)	101.					KILLING FROST-FREE PERIOD (DAYS)		133.		

SION

ELEVATION 2315 FEET	LATITUDE 53 54					LONGITUDE 114 8					
	MAY	JUNE	JULY	AUG	SEPT	MAY	JUNE	JULY	AUG	SEPT	
MEAN TEMPERATURE (F)	49.7	55.6	60.3	58.0	50.2	PRECIPITATION (IN)	1.4	3.0	2.0	3.1	1.8
MAX. TEMPERATURE (F)	61.4	67.6	72.6	69.4	61.1	MIN. TEMPERATURE (F)	38.4	44.1	48.6	47.0	39.7
DAYS ABOVE 32F (DAYS)	25.	29.	31.	31.	26.	DAYS ABOVE 42F (DAYS)	10.	20.	28.	26.	11.
DAYS ABOVE 26F (DAYS)	29.	30.	31.	31.	29.	DEG DAYS ABOVE 28F (F)	673.	829.	1002.	929.	665.
DEG DAYS ABOVE 32F (F)	550.	709.	878.	805.	545.	DEG DAYS ABOVE 42F (F)	258.	410.	568.	495.	259.
POT. EVAPOTRANS. (IN)	3.1	3.9	4.7	4.0	2.6	ACT. EVAPOTRANS. (IN)	3.1	3.4	3.0	2.9	1.8
WATER DEFICIENCY (IN)	0.0	0.5	1.7	1.1	0.8	DAY - LENGTH (HRS)	15.8	16.9	16.3	14.6	12.5
FROST-FREE PERIOD (DAYS)	114.					KILLING FROST-FREE PERIOD (DAYS)		141.			

VEGREVILLE

ELEVATION 2082 FEET	LATITUDE 53 29					LONGITUDE 112 3					
	MAY	JUNE	JULY	AUG	SEPT	MAY	JUNE	JULY	AUG	SEPT	
MEAN TEMPERATURE (F)	49.3	55.5	59.4	58.6	49.0	PRECIPITATION (IN)	1.3	2.6	3.0	2.9	1.5
MAX. TEMPERATURE (F)	63.2	69.4	75.7	72.6	62.3	MIN. TEMPERATURE (F)	38.5	45.3	50.3	48.2	39.1
DAYS ABOVE 32F (DAYS)	25.	29.	31.	31.	24.	DAYS ABOVE 42F (DAYS)	9.	22.	28.	25.	11.
DAYS ABOVE 26F (DAYS)	28.	30.	31.	31.	27.	DEG DAYS ABOVE 28F (F)	664.	825.	973.	948.	634.
DEG DAYS ABOVE 32F (F)	546.	706.	850.	825.	518.	DEG DAYS ABOVE 42F (F)	292.	449.	562.	569.	277.
POT. EVAPOTRANS. (IN)	3.2	4.0	4.6	4.0	2.5	ACT. EVAPOTRANS. (IN)	3.2	3.1	3.0	3.0	1.7
WATER DEFICIENCY (IN)	0.1	0.9	1.6	1.0	0.8	DAY - LENGTH (HRS)	15.7	16.7	16.2	14.5	12.5
FROST-FREE PERIOD (DAYS)	112.					KILLING FROST-FREE PERIOD (DAYS)		139.			