

Environment Canada
Inland Waters Directorate
Water Planning and Management Branch

ASSESSING THE EFFECT OF CLIMATE CHANGE
ON THE OPERATION OF A WATER-SUPPLY RESERVOIR

VOLUME II - APPENDICES

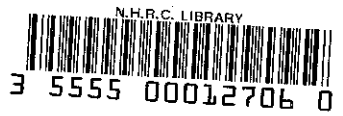
Jiri Haas
and
Tim J. Marta

Ottawa, Ontario

December, 1988

EC
IW
no.114
1988
v.2





Environment Canada
Inland Waters Directorate
Water Planning and Management Branch

ASSESSING THE EFFECT OF CLIMATE CHANGE
ON THE OPERATION OF A WATER-SUPPLY RESERVOIR

VOLUME II - APPENDICES

Jiri Haas
and
Tim J. Marta

Ottawa, Ontario

December, 1988

LIST OF APPENDICES

- APPENDIX A Data derived from the general circulation models
- APPENDIX B Evaporation - comparative results
- APPENDIX C-1 CRAE and CRLE model - climate data and normals
- APPENDIX C-2 CRAE and CRLE model - input data
- APPENDIX C-3 CRAE and CRLE model - results for Lake Diefenbaker
- APPENDIX D-1 Evaporation forecast for Lake Diefenbaker - method I
- APPENDIX D-2 Evaporation forecast for Lake Diefenbaker - method II
- APPENDIX E Evaluation of relative humidity and sunshine ratio extremes
- APPENDIX F Testing of influence of relative humidity and sunshine ratio using CRAE model
- APPENDIX G Calculation of evapotranspiration for 'normal' sunshine and 'low' and 'high' relative humidity using CRAE model
- APPENDIX H Application of program FLOWSTOR on Lake Diefenbaker

APPENDIX A

Data derived from the general circulation models

Temperature data

GISS grid - normals	A-1
GISS grid - 2 x CO2	A-2a
GFDL (GISS grid) - 2 x CO2	A-2b

Precipitation data

GISS grid - normals	A-3
GISS grid - 2 x CO2	A-4a
GFDL (GISS grid) - 2 x CO2	A-4b

Evapotranspiration data

GISS grid - normals	A-5
GISS grid - 2 x CO2	A-6a
GFDL (GISS grid) - 2 x CO2	A-6b

GCM - DERIVED DATA (Relative to the South Saskatchewan
River Basin to Lake Diefenbaker)

GISS Grid
Temperature normals (deg C)
1951 - 1980

GRID POINT	50N115W	50N110W	50N105W	54N115W	54N110W
JAN	-10.5	-12.0	-17.0	-17.0	-19.8
FEB	-7.5	-8.5	-12.5	-10.0	-14.5
MAR	-5.0	-4.0	-6.5	-6.0	-8.5
APR	4.0	4.0	4.5	3.0	3.0
MAY	11.7	11.0	10.7	9.5	10.5
JUN	10.0	16.4	16.2	13.5	14.2
JUL	13.0	19.2	19.0	15.6	16.6
AUG	13.0	19.0	19.0	14.4	15.2
SEP	9.0	13.0	12.0	9.4	9.7
OCT	3.5	6.0	6.0	4.8	4.0
NOV	-5.0	-2.0	-4.5	-5.0	-7.0
DEC	-7.5	-9.0	-11.5	-12.7	-15.0

GCM - DERIVED DATA (Relative to the South Saskatchewan
River Basin to Lake Diefenbaker)

GISS Grid
Temperature estimates for 2xCO2 (deg C)

GRID POINT	50N115W	50N110W	50N105W	54N115W	54N110W
JAN	-5.3	-6.1	-11.0	-11.4	-13.6
FEB	-2.6	-3.1	-6.9	-5.1	-9.0
MAR	-1.0	0.6	-1.7	-2.1	-4.0
APR	7.4	8.0	8.6	6.4	6.8
MAY	14.9	14.6	14.4	12.6	14.0
JUN	13.0	19.7	19.5	16.5	17.5
JUL	16.1	22.5	22.3	18.6	19.9
AUG	16.6	23.0	23.0	17.9	19.0
SEP	12.9	17.8	17.0	13.3	14.3
OCT	7.3	11.3	11.6	8.9	9.2
NOV	-1.0	3.5	1.4	-0.4	-1.2
DEC	-2.8	-3.2	-5.5	-7.4	-8.8

N. H. R. C. LIBRARY
BIBLIOTHÈQUE DU C. N. R. H.

GCM - DERIVED DATA (Relative to the South Saskatchewan
River Basin to Lake Diefenbaker)

GFDL (GISS Grid)

Temperature estimates for 2xCO2 (deg C)

GRID POINT	50N115W	50N110W	50N105W	54N115W	54N110W
JAN	-11.8	-13.2	-15.7	-16.8	-17.7
FEB	-7.3	-8.8	-11.4	-10.8	-11.7
MAR	-0.6	-1.9	-3.4	-2.9	-3.4
APR	10.9	10.5	9.1	9.3	9.0
MAY	14.1	14.2	14.9	13.8	13.2
JUN	15.9	16.0	17.5	13.9	14.1
JUL	18.9	18.7	19.2	16.5	16.8
AUG	19.2	18.9	18.7	17.2	17.2
SEP	13.2	13.0	13.2	12.4	12.4
OCT	8.4	8.3	8.3	6.9	7.1
NOV	-0.4	-1.0	-1.6	-4.5	-4.7
DEC	-6.8	-8.2	-10.5	-12.6	-13.2

BIBLIOTHÈQUE DU C.W.B.H.
1111 1111 1111

GCM - DERIVED DATA (Relative to the South Saskatchewan
River Basin to Lake Diefenbaker)

GISS Grid
Precipitation normals (mm)
1951 - 1980

GRID POINT	50N115W	50N110W	50N105W	54N115W	54N110W
JAN	99.0	22.0	19.0	25.0	22.0
FEB	54.0	23.0	20.0	20.0	17.0
MAR	50.0	16.0	22.0	19.0	19.0
APR	51.0	39.0	30.0	21.0	18.0
MAY	50.0	43.0	50.0	43.0	40.0
JUN	75.0	63.0	75.0	87.0	78.0
JUL	47.0	43.0	50.0	87.0	81.0
AUG	56.0	43.0	47.0	78.0	65.0
SEP	45.0	36.0	39.0	33.0	42.0
OCT	50.0	19.0	19.0	16.0	16.0
NOV	51.0	18.0	18.0	24.0	15.0
DEC	99.0	25.0	19.0	25.0	22.0
TOT	727.0	390.0	408.0	478.0	435.0
AVRG	60.6	32.5	34.0	39.8	36.2

GCM - DERIVED DATA (Relative to the South Saskatchewan
River Basin to Lake Diefenbaker)

GISS Grid
Precipitation estimates for 2xCO2 (mm)

GRID POINT	50N115W	50N110W	50N105W	54N115W	54N110W
JAN	139.0	31.0	25.0	34.0	31.0
FEB	73.0	31.0	28.0	28.0	23.0
MAR	68.0	22.0	25.0	25.0	25.0
APR	63.0	45.0	36.0	24.0	21.0
MAY	62.0	50.0	56.0	53.0	46.0
JUN	93.0	75.0	87.0	105.0	96.0
JUL	53.0	46.0	56.0	99.0	90.0
AUG	59.0	43.0	46.0	84.0	71.0
SEP	48.0	33.0	36.0	36.0	42.0
OCT	56.0	22.0	19.0	19.0	19.0
NOV	60.0	24.0	24.0	30.0	21.0
DEC	127.0	31.0	25.0	31.0	31.0
TOT	901.0	453.0	463.0	568.0	516.0
AVRG	75.1	37.7	38.6	47.3	43.0

GCM - DERIVED DATA (Relative to the South Saskatchewan
River Basin to Lake Diefenbaker)

GFDL (GISS Grid)

Precipitation estimates for 2xCO2 (mm)

GRID POINT	50N115W	50N110W	50N105W	54N115W	54N110W
JAN	33.0	29.0	25.0	33.0	31.0
FEB	26.0	28.0	24.0	36.0	34.0
MAR	24.0	24.0	25.0	24.0	22.0
APR	50.0	50.0	50.0	31.0	31.0
MAY	66.0	68.0	74.0	72.0	65.0
JUN	78.0	110.0	153.0	119.0	124.0
JUL	32.0	36.0	69.0	89.0	84.0
AUG	74.0	73.0	72.0	76.0	80.0
SEP	36.0	31.0	31.0	86.0	73.0
OCT	18.0	19.0	27.0	32.0	28.0
NOV	26.0	25.0	26.0	43.0	50.0
DEC	30.0	22.0	32.0	42.0	48.0
TOT	493.0	515.0	608.0	683.0	670.0
AVRG	41.1	42.9	50.7	56.9	55.8

GCM - DERIVED DATA (Lake Diefenbaker)

GISS Grid
 Potential evapotranspiration normals (mm)
 1951 - 1980

GRID POINT	50N115W	50N110W	50N105W	54N115W	54N110W
JAN	0.0	0.0	0.0	0.0	0.0
FEB	0.0	0.0	0.0	0.0	0.0
MAR	0.0	0.0	0.0	0.0	0.0
APR	33.0	23.0	27.0	24.0	23.0
MAY	89.0	71.0	70.0	74.0	78.0
JUN	83.0	112.0	112.0	106.0	109.0
JUL	100.0	128.0	127.0	117.0	122.0
AUG	91.0	116.0	116.0	98.0	101.0
SEP	59.0	69.0	65.0	59.0	59.0
OCT	24.0	27.0	28.0	27.0	22.0
NOV	0.0	0.0	0.0	0.0	0.0
DEC	0.0	0.0	0.0	0.0	0.0
TOT	477.0	548.0	544.0	505.0	514.0

GCM - DERIVED DATA (Lake Diefenbaker)

GISS Grid

Potential evapotranspiration estimates for 2xCO2 (mm)

GRID POINT	50N115W	50N110W	50N105W	54N115W	54N110W
JAN	0.0	0.0	0.0	0.0	0.0
FEB	0.0	0.0	0.0	0.0	0.0
MAR	0.0	0.0	0.0	0.0	0.0
APR	44.0	36.0	40.0	37.0	36.0
MAY	98.0	83.0	82.0	83.0	90.0
JUN	96.0	126.0	125.0	117.0	121.0
JUL	109.0	145.0	144.0	128.0	135.0
AUG	102.0	136.0	136.0	111.0	116.0
SEP	70.0	87.0	83.0	70.0	73.0
OCT	34.0	43.0	44.0	39.0	38.0
NOV	0.0	9.0	3.0	0.0	0.0
DEC	0.0	0.0	0.0	0.0	0.0
TOT	551.0	665.0	657.0	584.0	609.0

GCM - DERIVED DATA (Lake Diefenbaker)

GFDL (GISS Grid)

Potential evapotranspiration estimates for 2xCO2 (mm)

GRID POINT	50N115W	50N110W	50N105W	54N115W	54N110W
JAN	0.0	0.0	0.0	0.0	0.0
FEB	0.0	0.0	0.0	0.0	0.0
MAR	0.0	0.0	0.0	0.0	0.0
APR	59.0	58.0	49.0	56.0	54.0
MAY	88.0	89.0	93.0	93.0	89.0
JUN	105.0	106.0	116.0	100.0	102.0
JUL	123.0	122.0	125.0	115.0	118.0
AUG	114.0	113.0	111.0	108.0	108.0
SEP	67.0	66.0	67.0	67.0	67.0
OCT	35.0	35.0	35.0	31.0	32.0
NOV	0.0	0.0	0.0	0.0	0.0
DEC	0.0	0.0	0.0	0.0	0.0
TOT	592.0	589.0	595.0	571.0	570.0

APPENDIX B

Evaporation - comparative results

CRLE results

Results for Last Mountain Lake, Saskatchewan

B-1

Lake Diefenbaker evaporation calculated by Hopkinson

Gross evaporation 1972-1979

B-2a

Gross evaporation 1980-1986

B-2b

EVAPORATION - COMPARATIVE RESULTS

CRLE results for Last Mountain Lake, Saskatchewan
1973 - 1977 (mm)

=====				
Wet surface evpt. Lake evaporation				
(CRWE estimate)				
	Pan-size	Lake-	CRLE	Water
	EWP	size	estimate	budget
		EW	EL	EB
JAN	-3.0	-3.0	7.0	-2.0
FEB	-2.0	-2.0	-4.0	6.0
MAR	46.0	36.0	0.0	-2.0
APR	107.0	72.0	14.0	14.0
MAY	161.0	117.0	53.0	58.0
JUN	189.0	144.0	90.0	124.0
JUL	204.0	152.0	128.0	140.0
AUG	174.0	120.0	138.0	142.0
SEP	87.0	54.0	121.0	113.0
OCT	45.0	28.0	82.0	64.0
NOV	-3.0	-3.0	42.0	46.0
DEC	-3.0	-3.0	24.0	-1.0
TOT	1005.0	715.0	695.0	702.0

Latitude = 51.1 deg Altitude = 490 m
Average depth = 7.6 m Salinity = 1700 ppm

Dew point, air temperature and sunshine duration at
Regina, Moosejaw, Saskatoon, Wynyard.
Water budget evaporation from Morton, 1983.

EVAPORATION - COMPARATIVE RESULTS

Lake Diefenbaker evaporation calculated by Hopkinson
 Gross evaporation 1972-1979 (mm)

	1972	1973	1974	1975	1976	1977	1978	1979
JAN								
FEB								
MAR								
APR								
MAY	60.0	66.0	52.0	45.0	111.0	75.0	69.0	29.0
JUN	136.0	103.0	125.0	108.0	100.0	141.0	113.0	100.0
JUL	135.0	161.0	169.0	170.0	140.0	153.0	166.0	146.0
AUG	161.0	179.0	157.0	152.0	174.0	163.0	181.0	172.0
SEP	151.0	155.0	139.0	133.0	157.0	114.0	142.0	156.0
OCT	102.0	111.0	107.0	102.0	129.0	108.0	118.0	112.0
NOV	52.0	72.0	87.0	85.0	74.0	73.0	73.0	66.0
DEC	3.0	0.0	37.0	0.0	3.0	0.0	3.0	29.0
TOT	800.0	847.0	873.0	795.0	888.0	827.0	865.0	810.0

EVAPORATION - COMPARATIVE RESULTS

Lake Diefenbaker evaporation calculated by Hopkinson
 Gross evaporation 1980-1986 (mm)

	1980	1981	1982	1983	1984	1985	1986
JAN							
FEB							
MAR							
APR	36.0	44.0	10.0	23.0	53.0	18.0	41.0
MAY	121.0	87.0	39.0	73.0	99.0	84.0	62.0
JUN	133.0	109.0	86.0	120.0	101.0	123.0	135.0
JUL	155.0	138.0	137.0	146.0	189.0	182.0	145.0
AUG	163.0	173.0	163.0	209.0	218.0	159.0	174.0
SEP	142.0	175.0	142.0	166.0	133.0	124.0	128.0
OCT	121.0	119.0	91.0	103.0	121.0	96.0	102.0
NOV	77.0	64.0	59.0	70.0	36.0	57.0	75.0
DEC	24.0	26.0	3.0	14.0	0.0	0.0	26.0
TOT	972.0	935.0	730.0	924.0	950.0	843.0	888.0

APPENDIX C-1

CRAE and CRLE model - climate data and normals

Climate data

Outlook PFRA 1973	C-1-1
Saskatoon 1973	C-1-2
Swift Current A 1973	C-1-3
Outlook PFRA 1977	C-1-4
Saskatoon 1977	C-1-5
Swift Current A 1977	C-1-6

Climate normals

Precipitation normals	C-1-7
Temperature normals	C-1-8

Climate data

Outlook PFRA 1973

	sunshine (ratio)
JAN	.35
FEB	.35
MAR	.45
APR	.36
MAY	.51
JUN	.52
JUL	.65
AUG	.62
SEP	.52
OCT	.47
NOV	.19
DEC	.14

Climate data

Saskatoon 1973

dew point, temperature - Saskatoon A
sunshine - Saskatoon SRC

	dew point (degC)	tempera- ture (degC)	sunshine (ratio)	rel. humidity (ratio)
JAN	-16.7	-13.7	.46	.890
FEB	-17.5	-13.7	.41	.831
MAR	-5.4	-1.3	.53	.745
APR	-3.9	2.3	.43	.635
MAY	3.2	11.8	.57	.555
JUN	9.2	15.6	.54	.657
JUL	9.7	17.8	.64	.590
AUG	9.3	18.4	.66	.554
SEP	3.2	10.8	.54	.593
OCT	-1.4	5.7	.55	.602
NOV	-15.4	-12.4	.32	.881
DEC	-19.4	-16.1	.20	.882

Climate data

Swift Current A 1973

	dew point (degC)	tempera- ture (degC)	sunshine (ratio)	rel. humidity (ratio)
JAN	-11.7	-7.3	.50	.758
FEB	-11.1	-7.9	.48	.838
MAR	-4.2	1.5	.57	.657
APR	-1.9	2.6	.40	.721
MAY	1.5	11.0	.60	.519
JUN	6.7	15.7	.60	.550
JUL	6.9	18.0	.77	.482
AUG	7.2	19.1	.69	.459
SEP	3.4	11.3	.52	.582
OCT	-1.4	6.9	.54	.554
NOV	-11.6	-10.1	.29	.203
DEC	-12.7	-10.4	.18	.182

Climate data

Swift Current A 1977

	dew point (degC)	tempera- ture (degC)	sunshine (ratio)	rel. humidity (ratio)
JAN	-18.9	-15.9	.40	.076
FEB	-4.8	-1.9	.54	.820
MAR	-9.2	-1.1	.54	.546
APR	-5.3	7.5	.66	.397
MAY	4.4	12.6	.55	.573
JUN	6.4	16.2	.62	.522
JUL	9.1	17.5	.64	.578
AUG	6.0	13.9	.63	.589
SEP	5.1	10.7	.36	.683
OCT	-2.2	6.3	.55	.544
NOV	-11.2	-5.5	.52	.675
DEC	-17.1	-15.0	.18	.094

Precipitation normals

	Outlook PFRA	Sask. A	Swift Current A
JAN	17.3	17.8	21.1
FEB	14.7	16.4	17.2
MAR	14.9	18.4	20.1
APR	18.2	21.2	28.3
MAY	32.7	39.9	39.9
JUN	63.7	59.0	75.6
JUL	50.4	54.2	46.9
AUG	33.1	38.1	43.0
SEP	29.2	31.8	34.1
OCT	14.5	17.3	18.1
NOV	12.9	14.7	15.8
DEC	17.5	20.0	19.9
TOT	319.1	348.8	380.0

(Outlook PFRA + Saskatoon + Swift Current A) / 3 = 349.3

(Outlook PFRA + Swift Current A) / 2 = 349.5

Saskatoon A = 348.8

Temperature normals

	Outlook PFRA	Sask. A	Swift Current A
JAN	-17.2	-19.3	-14.7
FEB	-12.7	-14.6	-10.3
MAR	-6.7	-8.6	-5.7
APR	3.8	3.3	3.5
MAY	11.5	11.1	10.5
JUN	16.1	15.7	15.1
JUL	18.9	18.5	18.3
AUG	17.8	17.2	17.5
SEP	12.0	11.2	11.7
OCT	5.7	4.9	5.8
NOV	-4.6	-5.7	-3.7
DEC	-12.1	-14.1	-9.9
AVRG	2.7	1.6	3.2

APPENDIX C-2

CRAE and CRLE model - input data

Lake Diefenbaker 1973 - version I	C-2-1
Lake Diefenbaker 1977 - version I	C-2-2
Lake Diefenbaker 1973 - version II	C-2-3
Lake Diefenbaker 1977 - version II	C-2-4
Lake Diefenbaker 1973 - version III	C-2-5
Lake Diefenbaker 1977 - version III	C-2-6

Climate data

Outlook PFRA 1977

	sunshine (ratio)
JAN	.44
FEB	.48
MAR	.49
APR	.64
MAY	.51
JUN	.64
JUL	.60
AUG	.63
SEP	.37
OCT	(.55) ¹⁾
NOV	.49
DEC	.28

1) missing; replaced by (Saskatoon + Swift Current A)/2

Climate data

Saskatoon 1977

dew point, temperature - Saskatoon A
sunshine - Saskatoon SRC

	dew point (degC)	tempera- ture (degC)	sunshine (ratio)	rel. humidity (ratio)
JAN	-24.5	-19.6	.51	.037
FEB	-9.0	-6.3	.50	.862
MAR	-8.4	-2.8	.56	.670
APR	-4.5	7.3	.66	.428
MAY	5.5	14.0	.56	.565
JUN	6.1	16.8	.71	.492
JUL	8.2	17.8	.60	.534
AUG	6.1	13.6	.61	.605
SEP	6.1	10.6	.35	.737
OCT	-1.7	6.0	.55	.577
NOV	-11.6	-7.1	.58	.751
DEC	-22.7	-19.3	.31	.044

LAKE DIEFENBAKER 1973 - input data

Version I

$DP, T, S = (\text{Saskatoon} + \text{Swift Current A})/2$

	dew point (deg C)	tempera- ture (deg C)	sunshine (ratio)
JAN	-14.2	-10.5	.48
FEB	-14.3	-10.8	.44
MAR	-4.8	0.1	.55
APR	-2.9	2.4	.41
MAY	2.3	11.4	.58
JUN	7.9	15.6	.57
JUL	8.3	17.9	.70
AUG	8.2	18.7	.67
SEP	3.3	11.0	.53
OCT	-1.4	6.3	.54
NOV	-13.5	-11.2	.30
DEC	-16.0	-13.2	.19

LAKE DIEFENBAKER 1977 - input data

Version I

DP,T,S = (Saskatoon + Swift Current A)/2

	dew point (deg C)	tempera- ture (deg C)	sunshine (ratio)
JAN	-21.7	-17.7	.45
FEB	-6.9	-4.1	.52
MAR	-8.8	-1.4	.55
APR	-4.9	7.4	.66
MAY	4.9	13.3	.55
JUN	6.2	16.5	.66
JUL	8.6	17.6	.62
AUG	6.0	13.7	.62
SEP	5.6	10.6	.35
OCT	-1.9	6.1	.55
NOV	-11.4	-6.3	.55
DEC	-19.9	-17.1	.24

LAKE DIEFENBAKER 1973 - input data

Version II

DP,T = (Saskatoon + Swift Current A)/2
S = Outlook PFRA

	dew point (deg C)	tempera- ture (deg C)	sunshine (ratio)
JAN	-14.2	-10.5	.35
FEB	-14.3	-10.8	.35
MAR	-4.8	0.1	.45
APR	-2.9	2.4	.36
MAY	2.3	11.4	.51
JUN	7.9	15.6	.52
JUL	8.3	17.9	.65
AUG	8.2	18.7	.62
SEP	3.3	11.0	.52
OCT	-1.4	6.3	.47
NOV	-13.5	-11.2	.19
DEC	-16.0	-13.2	.14

LAKE DIEFENBAKER 1977 - input data

Version II

DP,T = (Saskatoon + Swift Current A)/2
S = Outlook FFRA

	dew point (deg C)	tempera- ture (deg C)	sunshine (ratio)
JAN	-21.7	-17.7	.44
FEB	-6.9	-4.1	.48
MAR	-8.8	-1.4	.49
APR	-4.9	7.4	.64
MAY	4.9	13.3	.51
JUN	6.2	16.5	.64
JUL	8.6	17.6	.60
AUG	6.0	13.7	.63
SEP	5.6	10.6	.37
OCT	-1.9	6.1	.55
NOV	-11.4	-6.3	.49
DEC	-19.9	-17.1	.28

LAKE DIEFENBAKER 1973 - input data

Version III

DP,T = (Saskatoon + Swift Current A)/2
S = Swift Current A

	dew point (deg C)	tempera- ture (deg C)	sunshine (ratio)
JAN	-14.2	-10.5	.50
FEB	-14.3	-10.8	.48
MAR	-4.8	0.1	.57
APR	-2.9	2.4	.40
MAY	2.3	11.4	.60
JUN	7.9	15.6	.60
JUL	8.3	17.9	.77
AUG	8.2	18.7	.69
SEP	3.3	11.0	.52
OCT	-1.4	6.3	.54
NOV	-13.5	-11.2	.29
DEC	-16.0	-13.2	.18

LAKE DIEFENBAKER 1977 - input data

Version III

DP,T = (Saskatoon + Swift Current A)/2
S = Swift Current A

	dew point (deg C)	tempera- ture (deg C)	sunshine (ratio)
JAN	-21.7	-17.7	.40
FEB	-6.9	-4.1	.54
MAR	-8.8	-1.4	.54
APR	-4.9	7.4	.66
MAY	4.9	13.3	.55
JUN	6.2	16.5	.62
JUL	8.6	17.6	.64
AUG	6.0	13.7	.63
SEP	5.6	10.6	.36
OCT	-1.9	6.1	.55
NOV	-11.4	-6.3	.52
DEC	-19.9	-17.1	.18

APPENDIX C-3

CRAE and CRLE model - results for Lake Diefenbaker

CRLE results

Evaluation of sunshine data for average depth DA = 40 m

S = (Saskatoon SRC + Swift Current A) / 2 C-3-1
S = Outlook PFRA C-3-2
S = Swift Current A C-3-3

Evaluation of lake depth

S = (Saskatoon SRC + Swift Current A) / 2
Simulated lake depth DA=10 m (calibration) C-3-4
Upper lake depth DA = 20 m C-3-5
Lower lake depth DA = 50 m C-3-6

S = Swift Current A
Simulated lake depth DA=10 m (calibration) C-3-7
Upper lake depth DA = 20 m C-3-8
Lower lake depth DA = 50 m C-3-9

CRAE results for Lake Diefenbaker area

S = (Saskatoon SRC + Swift Current A) / 2 C-3-10
S = Swift Current A C-3-11

$$S = (\text{Saskatoon SRC} + \text{Swift Current A}) / 2$$

CRLE Model

LAKE DIEFENBAKER		PHID= 50.80	ALTI= 545.0	DA= 40.0	SALT=	.00	NET	EVAPORATION		GW(W/M*H)	
YEAR	MONTH	STARTDAY	LENGTH	TD	T	S	HADD	RAD.	POTENT.		LAKE
1973	JAN	1	31	-14.2	-10.5	.480	.00	26.	22.	22.	
1973	FEB	1	28	-14.3	-10.8	.440	.00	-9.	2.	2.	
1973	MAR	1	31	-4.8	.1	.550	.00	-41.	6.	5.	
1973	APR	1	30	-2.9	2.4	.410	.00	-27.	11.	8.	
1973	MAY	1	31	2.3	11.4	.580	.00	-9.	40.	21.	
1973	JUNE	1	30	7.9	15.6	.570	.00	41.	92.	52.	
1973	JULY	1	31	8.3	17.9	.700	.00	83.	160.	87.	
1973	AUG	1	31	8.2	18.7	.670	.00	126.	196.	118.	
1973	SEPT	1	30	3.3	11.0	.530	.00	152.	149.	113.	
1973	OCT	1	31	-1.4	6.3	.540	.00	151.	131.	101.	
1973	NOV	1	30	-13.5	-11.2	.300	.00	149.	66.	66.	
1973	DEC	1	31	-16.0	-13.2	.190	.00	106.	46.	46.	
1977	JAN	1	31	-21.7	-17.7	.450	.00	33.	20.	20.	12.85
1977	FEB	1	28	-6.9	-4.1	.520	.00	-16.	2.	2.	46.84
1977	MAR	1	31	-8.8	-1.4	.550	.00	-36.	9.	4.	125.47
1977	APR	1	30	-4.9	7.4	.660	.00	-41.	28.	8.	202.36
1977	MAY	1	31	4.9	13.3	.550	.00	7.	51.	30.	214.34
1977	JUNE	1	30	6.2	16.5	.660	.00	52.	117.	63.	261.24
1977	JULY	1	31	8.6	17.6	.620	.00	107.	167.	102.	238.01
1977	AUG	1	31	6.0	13.7	.620	.00	143.	158.	115.	205.99
1977	SEPT	1	30	5.6	10.6	.350	.00	171.	137.	124.	103.85
1977	OCT	1	31	-1.9	6.1	.550	.00	144.	128.	96.	92.79
1977	NOV	1	30	-11.4	-6.3	.550	.00	107.	58.	58.	54.95
1977	DEC	1	31	-19.9	-17.1	.240	.00	100.	37.	37.	7.07
**** GLBGN =		110.7627	**** GLEND =		112.6133						

LAKE DIEFENBAKER MONTHLY TOTALS AVERAGED OVER 2 YEARS

MONTH	NET RAD.	EVAPORATION POTENT.	LAKE
JAN	29.2	21.3	21.3
FEB	-12.5	2.0	2.0
MAR	-38.4	7.3	4.4
APR	-34.4	19.6	8.0
MAY	-1.1	45.5	25.5
JUNE	46.4	104.2	57.3
JULY	95.1	163.1	94.3
AUG	134.0	177.0	116.5
SEPT	161.4	143.3	118.2
OCT	147.5	129.4	98.7
NOV	127.9	62.2	62.2
DEC	103.1	41.5	41.5

TOTAL OF MONTHLY AVERAGES 758.3 916.4 650.0

S = Outlook PFRA

CRLE model

LAKE DIEFENBAKER		PHID= 50.80	ALTI= 545.0	DA= 40.0	SALT=	.00	NET	EVAPORATION		GW(W/M*M)	
YEAR	MONTH	STARTDAY	LENGTH	TD	T	S	HADD	RAD.	POTENT.		LAKE
1973	JAN	1	31	-14.2	-10.5	.350	.00	34.	25.	25.	
1973	FEB	1	28	-14.3	-10.8	.350	.00	-1.	4.	4.	
1973	MAR	1	31	-4.8	.1	.450	.00	-40.	6.	5.	
1973	APR	1	30	-2.9	2.4	.360	.00	-29.	11.	7.	
1973	MAY	1	31	2.3	11.4	.510	.00	-14.	38.	19.	
1973	JUNE	1	30	7.9	15.6	.520	.00	31.	81.	46.	
1973	JULY	1	31	8.3	17.9	.650	.00	70.	144.	78.	
1973	AUG	1	31	8.2	18.7	.620	.00	112.	188.	109.	
1973	SEPT	1	30	3.3	11.0	.520	.00	138.	142.	105.	
1973	OCT	1	31	-1.4	6.3	.470	.00	143.	127.	96.	
1973	NOV	1	30	-13.5	-11.2	.190	.00	142.	63.	63.	
1973	DEC	1	31	-16.0	-13.2	.140	.00	100.	43.	43.	
1977	JAN	1	31	-21.7	-17.7	.440	.00	27.	19.	19.	12.73
1977	FEB	1	28	-6.9	-4.1	.480	.00	-17.	1.	1.	44.61
1977	MAR	1	31	-8.8	-1.4	.490	.00	-36.	9.	4.	115.96
1977	APR	1	30	-4.9	7.4	.640	.00	-44.	27.	7.	198.33
1977	MAY	1	31	4.9	13.3	.510	.00	4.	49.	28.	203.62
1977	JUNE	1	30	6.2	16.5	.640	.00	47.	111.	60.	256.08
1977	JULY	1	31	8.6	17.6	.600	.00	101.	163.	98.	232.96
1977	AUG	1	31	6.0	13.7	.630	.00	135.	154.	110.	208.15
1977	SEPT	1	30	5.6	10.6	.370	.00	164.	134.	119.	107.90
1977	OCT	1	31	-1.9	6.1	.550	.00	141.	127.	95.	92.79
1977	NOV	1	30	-11.4	-6.3	.490	.00	110.	59.	59.	50.92
1977	DEC	1	31	-19.9	-17.1	.280	.00	99.	37.	37.	7.64

**** GLBGN = 104.2589

**** GLEND = 112.1494

LAKE DIEFENBAKER MONTHLY TOTALS AVERAGED OVER 2 YEARS

MONTH	NET RAD.	EVAPORATION POTENT.	LAKE
JAN	30.3	22.0	22.0
FEB	-9.3	2.5	2.5
MAR	-37.6	7.6	4.7
APR	-36.3	19.0	7.3
MAY	-4.9	43.1	23.6
JUNE	39.2	95.6	52.7
JULY	85.6	153.5	87.9
AUG	123.6	171.1	109.5
SEPT	151.3	138.0	111.8
OCT	142.0	126.9	95.5
NOV	125.9	61.3	61.3
DEC	99.6	40.3	40.3

TOTAL OF MONTHLY AVERAGES 709.4 880.8 619.1

S = Swift Current A

CRLE model

LAKE DIEFENBAKER		PHID= 50.80	ALTI= 545.0	DA= 40.0	SALT=	.00	NET	EVAPORATION		GW(W/M*H)	
YEAR	MONTH	STARTDAY	LENGTH	TD	T	S	HADD	RAD.	POTENT.		LAKE
1973	JAN	1	31	-14.2	-10.5	.500	.00	26.	22.	22.	
1973	FEB	1	28	-14.3	-10.8	.480	.00	-10.	2.	2.	
1973	MAR	1	31	-4.8	.1	.570	.00	-41.	6.	4.	
1973	APR	1	30	-2.9	2.4	.400	.00	-26.	12.	8.	
1973	MAY	1	31	2.3	11.4	.600	.00	-9.	40.	21.	
1973	JUNE	1	30	7.9	15.6	.600	.00	40.	91.	51.	
1973	JULY	1	31	8.3	17.9	.770	.00	83.	160.	87.	
1973	AUG	1	31	8.2	18.7	.690	.00	131.	199.	122.	
1973	SEPT	1	30	3.3	11.0	.520	.00	161.	154.	119.	
1973	OCT	1	31	-1.4	6.3	.540	.00	159.	134.	105.	
1973	NOV	1	30	-13.5	-11.2	.290	.00	153.	68.	68.	
1973	DEC	1	31	-16.0	-13.2	.180	.00	108.	46.	46.	
1977	JAN	1	31	-21.7	-17.7	.400	.00	38.	22.	22.	12.22
1977	FEB	1	28	-6.9	-4.1	.540	.00	-16.	2.	2.	47.91
1977	MAR	1	31	-8.8	-1.4	.540	.00	-35.	9.	4.	123.92
1977	APR	1	30	-4.9	7.4	.660	.00	-41.	28.	8.	202.36
1977	MAY	1	31	4.9	13.3	.550	.00	6.	51.	30.	214.34
1977	JUNE	1	30	6.2	16.5	.620	.00	54.	119.	64.	250.82
1977	JULY	1	31	8.6	17.6	.640	.00	105.	165.	100.	242.96
1977	AUG	1	31	6.0	13.7	.630	.00	139.	157.	113.	208.15
1977	SEPT	1	30	5.6	10.6	.360	.00	169.	136.	122.	105.89
1977	OCT	1	31	-1.9	6.1	.550	.00	145.	129.	97.	92.79
1977	NOV	1	30	-11.4	-6.3	.520	.00	110.	59.	59.	52.97
1977	DEC	1	31	-19.9	-17.1	.180	.00	102.	38.	38.	6.09
**** GLBGN = 111.8474		**** GLEND = 112.7812									

LAKE DIEFENBAKER MONTHLY TOTALS AVERAGED OVER 2 YEARS

MONTH	NET RAD.	EVAPORATION POTENT.	LAKE
JAN	32.1	21.9	21.9
FEB	-13.2	1.8	1.8
MAR	-38.4	7.3	4.4
APR	-33.6	19.8	8.2
MAY	-1.1	45.4	25.5
JUNE	46.8	104.8	57.6
JULY	93.9	162.4	93.6
AUG	135.0	177.6	117.2
SEPT	164.9	145.1	120.4
OCT	151.7	131.4	101.1
NOV	131.1	63.6	63.6
DEC	105.0	42.1	42.1

TOTAL OF MONTHLY AVERAGES 774.3 923.3 657.6

$S = (\text{Saskatoon SRC} + \text{Swift Current A}) / 2$
Simulated lake depth DA = 10 m (calibration)

CRLE model

LAKE DIEFENBAKER		PHID= 50.80	ALTI= 545.0	DA= 10.0	SALT= .00	NET	EVAPORATION				
YEAR	MONTH	STARTDAY	LENGTH	TD	T	S	HADD	RAD.	POTENT.	LAKE	GW(W/M*M)
1973	JAN	1	31	-14.2	-10.5	.480	.00	-19.	1.	1.	
1973	FEB	1	28	-14.3	-10.8	.440	.00	-32.	-2.	-2.	
1973	MAR	1	31	-4.8	.1	.550	.00	-53.	3.	1.	
1973	APR	1	30	-2.9	2.4	.410	.00	-13.	16.	13.	
1973	MAY	1	31	2.3	11.4	.580	.00	25.	69.	39.	
1973	JUNE	1	30	7.9	15.6	.570	.00	81.	130.	78.	
1973	JULY	1	31	8.3	17.9	.700	.00	128.	185.	117.	
1973	AUG	1	31	8.2	18.7	.670	.00	160.	216.	142.	
1973	SEPT	1	30	3.3	11.0	.530	.00	167.	157.	123.	
1973	OCT	1	31	-1.4	6.3	.540	.00	137.	124.	93.	
1973	NOV	1	30	-13.5	-11.2	.300	.00	115.	52.	52.	
1973	DEC	1	31	-16.0	-13.2	.190	.00	58.	30.	30.	
1977	JAN	1	31	-21.7	-17.7	.450	.00	-13.	1.	1.	12.85
1977	FEB	1	28	-6.9	-4.1	.520	.00	-39.	-5.	-5.	46.84
1977	MAR	1	31	-8.8	-1.4	.550	.00	-44.	7.	2.	125.47
1977	APR	1	30	-4.9	7.4	.660	.00	-24.	33.	14.	202.36
1977	MAY	1	31	4.9	13.3	.550	.00	50.	100.	56.	214.34
1977	JUNE	1	30	6.2	16.5	.660	.00	97.	164.	93.	261.24
1977	JULY	1	31	8.6	17.6	.620	.00	148.	190.	129.	238.01
1977	AUG	1	31	6.0	13.7	.620	.00	172.	175.	134.	205.99
1977	SEPT	1	30	5.6	10.6	.350	.00	178.	141.	128.	103.85
1977	OCT	1	31	-1.9	6.1	.550	.00	120.	117.	83.	92.79
1977	NOV	1	30	-11.4	-6.3	.550	.00	69.	44.	42.	54.95
1977	DEC	1	31	-19.9	-17.1	.240	.00	65.	28.	28.	7.07
**** GLBGN =		59.0543	**** GLEND =		79.5922						

LAKE DIEFENBAKER MONTHLY TOTALS AVERAGED OVER 2 YEARS

MONTH	NET RAD.	EVAPORATION POTENT.	LAKE
JAN	-15.8	1.1	1.1
FEB	-35.2	-3.3	-3.3
MAR	-48.4	4.7	1.8
APR	-18.7	24.5	13.4
MAY	37.4	84.4	47.4
JUNE	89.1	146.6	85.5
JULY	137.7	187.5	123.2
AUG	165.9	195.1	138.2
SEPT	172.4	149.0	125.3
OCT	128.4	120.7	87.9
NOV	92.2	48.2	46.8
DEC	61.6	29.0	29.0

TOTAL OF MONTHLY AVERAGES 766.5 987.4 696.0

$$S = (\text{Saskatoon SRC} + \text{Swift Current A}) / 2$$

Upper lake depth DA = 20m

CRLE model

LAKE DIEFENBAKER		PHID= 50.80	ALTI= 545.0	DA= 20.0	SALT=	.00	NET	EVAPORATION		GW(W/M*H)	
YEAR	MONTH	STARTDAY	LENGTH	TD	T	S	HADD	RAD.	POTENT.		LAKE
1973	JAN	1	31	-14.2	-10.5	.480	.00	-7.	4.	4.	
1973	FEB	1	28	-14.3	-10.8	.440	.00	-26.	-1.	-1.	
1973	MAR	1	31	-4.8	.1	.550	.00	-51.	3.	2.	
1973	APR	1	30	-2.9	2.4	.410	.00	-19.	14.	11.	
1973	MAY	1	31	2.3	11.4	.580	.00	14.	57.	33.	
1973	JUNE	1	30	7.9	15.6	.570	.00	69.	123.	70.	
1973	JULY	1	31	8.3	17.9	.700	.00	115.	178.	108.	
1973	AUG	1	31	8.2	18.7	.670	.00	151.	210.	136.	
1973	SEPT	1	30	3.3	11.0	.530	.00	164.	156.	121.	
1973	OCT	1	31	-1.4	6.3	.540	.00	143.	127.	96.	
1973	NOV	1	30	-13.5	-11.2	.300	.00	126.	57.	57.	
1973	DEC	1	31	-16.0	-13.2	.190	.00	73.	34.	34.	
1977	JAN	1	31	-21.7	-17.7	.450	.00	-1.	2.	2.	12.85
1977	FEB	1	28	-6.9	-4.1	.520	.00	-33.	-3.	-3.	46.84
1977	MAR	1	31	-8.8	-1.4	.550	.00	-43.	7.	2.	125.47
1977	APR	1	30	-4.9	7.4	.660	.00	-31.	31.	12.	202.36
1977	MAY	1	31	4.9	13.3	.550	.00	36.	84.	47.	214.34
1977	JUNE	1	30	6.2	16.5	.660	.00	83.	155.	84.	261.24
1977	JULY	1	31	8.6	17.6	.620	.00	136.	183.	122.	238.01
1977	AUG	1	31	6.0	13.7	.620	.00	164.	170.	129.	205.99
1977	SEPT	1	30	5.6	10.6	.350	.00	177.	141.	127.	103.85
1977	OCT	1	31	-1.9	6.1	.550	.00	129.	121.	88.	92.79
1977	NOV	1	30	-11.4	-6.3	.550	.00	82.	48.	47.	54.95
1977	DEC	1	31	-19.9	-17.1	.240	.00	75.	31.	31.	7.07
		**** GLBGN = 74.8370			**** GLEND = 89.1094						

LAKE DIEFENBAKER MONTHLY TOTALS AVERAGED OVER 2 YEARS

MONTH	NET RAD.	EVAPORATION POTENT.	LAKE
JAN	-3.8	3.0	3.0
FEB	-29.5	-2.0	-2.0
MAR	-46.8	5.1	2.2
APR	-25.0	22.5	11.2
MAY	24.7	70.4	39.8
JUNE	76.1	139.0	77.1
JULY	125.4	180.4	114.8
AUG	157.5	190.2	132.4
SEPT	170.6	148.1	124.1
OCT	135.9	124.1	92.1
NOV	103.9	52.6	51.7
DEC	74.1	32.6	32.6

TOTAL OF MONTHLY AVERAGES 763.1 966.1 678.9

$S = (\text{Saskatoon SRC} + \text{Smith Current A}) / 2$
 Lower lake depth $DA = 50\text{m}$

CRLE model

LAKE DIEFENBAKER		PHID= 50.80	ALTI= 545.0	DA= 50.0	SALT=	.00	NET	EVAPORATION			
YEAR	MONTH	STARTDAY	LENGTH	TD	T	S	HADD	RAD.	POTENT.	LAKE	GW(W/M*H)
1973	JAN	1	31	-14.2	-10.5	.480	.00	58.	33.	33.	
1973	FEB	1	28	-14.3	-10.8	.440	.00	11.	16.	16.	
1973	MAR	1	31	-4.8	.1	.550	.00	-26.	10.	9.	
1973	APR	1	30	-2.9	2.4	.410	.00	-29.	11.	8.	
1973	MAY	1	31	2.3	11.4	.580	.00	-25.	33.	14.	
1973	JUNE	1	30	7.9	15.6	.570	.00	16.	63.	36.	
1973	JULY	1	31	8.3	17.9	.700	.00	53.	122.	66.	
1973	AUG	1	31	8.2	18.7	.670	.00	98.	180.	100.	
1973	SEPT	1	30	3.3	11.0	.530	.00	135.	140.	102.	
1973	OCT	1	31	-1.4	6.3	.540	.00	152.	131.	101.	
1973	NOV	1	30	-13.5	-11.2	.300	.00	164.	73.	73.	
1973	DEC	1	31	-16.0	-13.2	.190	.00	135.	56.	56.	
1977	JAN	1	31	-21.7	-17.7	.450	.00	65.	28.	28.	12.85
1977	FEB	1	28	-6.9	-4.1	.520	.00	4.	9.	9.	46.84
1977	MAR	1	31	-8.8	-1.4	.550	.00	-24.	12.	8.	125.47
1977	APR	1	30	-4.9	7.4	.660	.00	-45.	27.	7.	202.36
1977	MAY	1	31	4.9	13.3	.550	.00	-15.	38.	19.	214.34
1977	JUNE	1	30	6.2	16.5	.660	.00	24.	83.	45.	261.24
1977	JULY	1	31	8.6	17.6	.620	.00	78.	150.	82.	238.01
1977	AUG	1	31	6.0	13.7	.620	.00	118.	145.	99.	205.99
1977	SEPT	1	30	5.6	10.6	.350	.00	159.	131.	116.	103.85
1977	OCT	1	31	-1.9	6.1	.550	.00	151.	132.	100.	92.79
1977	NOV	1	30	-11.4	-6.3	.550	.00	127.	67.	67.	54.95
1977	DEC	1	31	-19.9	-17.1	.240	.00	123.	44.	44.	7.07
		**** GLBGN = 142.8284			**** GLEND = 135.3051						

LAKE DIEFENBAKER MONTHLY TOTALS AVERAGED OVER 2 YEARS

MONTH	NET RAD.	EVAPORATION POTENT.	LAKE
JAN	61.5	30.1	30.1
FEB	7.8	12.8	12.8
MAR	-24.9	11.1	8.4
APR	-36.7	18.9	7.2
MAY	-19.9	35.5	16.4
JUNE	20.3	73.0	40.5
JULY	65.3	135.9	74.2
AUG	108.1	162.5	99.3
SEPT	147.1	135.8	109.1
OCT	151.4	131.2	100.9
NOV	145.5	70.3	70.3
DEC	128.6	50.2	50.2

TOTAL OF MONTHLY AVERAGES 754.1 867.1 619.3

S = Swift Current A
 Simulated lake depth DA = 10 m (calibration)

CRLE model

LAKE DIEFENBAKER		PHID= 50.80	ALTI= 545.0	DA= 10.0	SALT=	.00	NET	EVAPORATION		GW(W/M*H)	
YEAR	MONTH	STARTDAY	LENGTH	TD	T	S	HADD	RAD.	POTENT.		LAKE
1973	JAN	1	31	-14.2	-10.5	.500	.00	-19.	1.	1.	
1973	FEB	1	28	-14.3	-10.8	.480	.00	-33.	-2.	-2.	
1973	MAR	1	31	-4.8	.1	.570	.00	-53.	3.	1.	
1973	APR	1	30	-2.9	2.4	.400	.00	-11.	16.	13.	
1973	MAY	1	31	2.3	11.4	.600	.00	25.	69.	39.	
1973	JUNE	1	30	7.9	15.6	.600	.00	81.	129.	78.	
1973	JULY	1	31	8.3	17.9	.770	.00	130.	186.	118.	
1973	AUG	1	31	8.2	18.7	.690	.00	169.	221.	148.	
1973	SEPT	1	30	3.3	11.0	.520	.00	178.	163.	130.	
1973	OCT	1	31	-1.4	6.3	.540	.00	142.	126.	96.	
1973	NOV	1	30	-13.5	-11.2	.290	.00	117.	53.	53.	
1973	DEC	1	31	-16.0	-13.2	.180	.00	59.	30.	30.	
1977	JAN	1	31	-21.7	-17.7	.400	.00	-9.	1.	1.	12.22
1977	FEB	1	28	-6.9	-4.1	.540	.00	-39.	-5.	-5.	47.91
1977	MAR	1	31	-8.8	-1.4	.540	.00	-43.	7.	2.	123.92
1977	APR	1	30	-4.9	7.4	.660	.00	-24.	33.	14.	202.36
1977	MAY	1	31	4.9	13.3	.550	.00	50.	99.	56.	214.34
1977	JUNE	1	30	6.2	16.5	.620	.00	98.	165.	94.	250.82
1977	JULY	1	31	8.6	17.6	.640	.00	143.	187.	126.	242.96
1977	AUG	1	31	6.0	13.7	.630	.00	168.	172.	132.	208.15
1977	SEPT	1	30	5.6	10.6	.360	.00	178.	141.	128.	105.89
1977	OCT	1	31	-1.9	6.1	.550	.00	122.	118.	84.	92.79
1977	NOV	1	30	-11.4	-6.3	.520	.00	72.	45.	43.	52.97
1977	DEC	1	31	-19.9	-17.1	.180	.00	66.	28.	28.	6.09

**** GLBGN = 59.1547 **** GLEND = 78.7541

LAKE DIEFENBAKER MONTHLY TOTALS AVERAGED OVER 2 YEARS

MONTH	NET RAD.	EVAPORATION POTENT.	LAKE
JAN	-14.0	1.3	1.3
FEB	-36.3	-3.5	-3.5
MAR	-48.4	4.7	1.8
APR	-17.7	24.8	13.7
MAY	37.1	84.1	47.2
JUNE	89.7	146.9	85.9
JULY	136.7	186.9	122.5
AUG	168.4	196.6	140.0
SEPT	177.6	151.8	128.7
OCT	131.9	122.3	89.9
NOV	94.2	49.0	47.7
DEC	62.4	29.2	29.2

TOTAL OF MONTHLY AVERAGES 781.7 994.0 704.1

S = Swift Current A
 Upper lake depth DA = 20 m

CRLE model

LAKE DIEFENBAKER		PHID= 50.80	ALTI= 545.0	DA= 20.0	SALT=	.00	NET	EVAPORATION			
YEAR	MONTH	STARTDAY	LENGTH	TD	T	S	HADD	RAD.	POTENT.	LAKE	GW(W/M*M)
1973	JAN	1	31	-14.2	-10.5	.500	.00	-7.	4.	4.	
1973	FEB	1	28	-14.3	-10.8	.480	.00	-27.	-1.	-1.	
1973	MAR	1	31	-4.8	.1	.570	.00	-51.	3.	2.	
1973	APR	1	30	-2.9	2.4	.400	.00	-17.	15.	11.	
1973	MAY	1	31	2.3	11.4	.600	.00	14.	57.	33.	
1973	JUNE	1	30	7.9	15.6	.600	.00	68.	122.	70.	
1973	JULY	1	31	8.3	17.9	.770	.00	116.	178.	109.	
1973	AUG	1	31	8.2	18.7	.690	.00	158.	215.	141.	
1973	SEPT	1	30	3.3	11.0	.520	.00	174.	161.	127.	
1973	OCT	1	31	-1.4	6.3	.540	.00	149.	130.	100.	
1973	NOV	1	30	-13.5	-11.2	.290	.00	129.	58.	58.	
1973	DEC	1	31	-16.0	-13.2	.180	.00	74.	35.	35.	
1977	JAN	1	31	-21.7	-17.7	.400	.00	3.	4.	4.	12.22
1977	FEB	1	28	-6.9	-4.1	.540	.00	-34.	-3.	-3.	47.91
1977	MAR	1	31	-8.8	-1.4	.540	.00	-42.	7.	3.	123.92
1977	APR	1	30	-4.9	7.4	.660	.00	-31.	31.	12.	202.36
1977	MAY	1	31	4.9	13.3	.550	.00	35.	83.	47.	214.34
1977	JUNE	1	30	6.2	16.5	.620	.00	85.	157.	85.	250.82
1977	JULY	1	31	8.6	17.6	.640	.00	133.	181.	119.	242.96
1977	AUG	1	31	6.0	13.7	.630	.00	161.	168.	127.	208.15
1977	SEPT	1	30	5.6	10.6	.360	.00	177.	140.	127.	105.89
1977	OCT	1	31	-1.9	6.1	.550	.00	131.	122.	89.	92.79
1977	NOV	1	30	-11.4	-6.3	.520	.00	84.	49.	48.	52.97
1977	DEC	1	31	-19.9	-17.1	.180	.00	76.	31.	31.	5.09
		**** GLBGN = 75.1757			**** GLEND = 88.6132						

LAKE DIEFENBAKER MONTHLY TOTALS AVERAGED OVER 2 YEARS

MONTH	NET RAD.	EVAPORATION POTENT.	LAKE
JAN	-1.9	3.6	3.6
FEB	-30.5	-2.2	-2.2
MAR	-46.8	5.1	2.2
APR	-24.0	22.8	11.5
MAY	24.5	70.2	39.7
JUNE	76.6	139.8	77.5
JULY	124.4	179.8	114.1
AUG	159.4	191.5	133.8
SEPT	175.3	150.6	127.2
OCT	139.7	125.9	94.3
NOV	106.4	53.5	52.8
DEC	75.3	32.9	32.9

TOTAL OF MONTHLY AVERAGES 778.4 973.3 687.1

S = Swift Current A
 Lower lake depth DA = 50m

CRLE model

LAKE DIEFENBAKER		PHID= 50.80	ALTI= 545.0	DA= 50.0	SALT=	.00	NET	EVAPORATION		GW(W/M*M)	
YEAR	MONTH	STARTDAY	LENGTH	TD	T	S	HADD	RAD.	POTENT.		LAKE
1973	JAN	1	31	-14.2	-10.5	.500	.00	59.	33.	33.	
1973	FEB	1	28	-14.3	-10.8	.480	.00	11.	16.	16.	
1973	MAR	1	31	-4.8	.1	.570	.00	-26.	10.	9.	
1973	APR	1	30	-2.9	2.4	.400	.00	-27.	11.	8.	
1973	MAY	1	31	2.3	11.4	.600	.00	-24.	33.	14.	
1973	JUNE	1	30	7.9	15.6	.600	.00	16.	62.	36.	
1973	JULY	1	31	8.3	17.9	.770	.00	52.	121.	65.	
1973	AUG	1	31	8.2	18.7	.690	.00	102.	182.	102.	
1973	SEPT	1	30	3.3	11.0	.520	.00	142.	144.	107.	
1973	OCT	1	31	-1.4	6.3	.540	.00	160.	135.	106.	
1973	NOV	1	30	-13.5	-11.2	.290	.00	170.	76.	76.	
1973	DEC	1	31	-16.0	-13.2	.180	.00	138.	57.	57.	
1977	JAN	1	31	-21.7	-17.7	.400	.00	71.	29.	29.	12.22
1977	FEB	1	28	-6.9	-4.1	.540	.00	4.	9.	9.	47.91
1977	MAR	1	31	-8.8	-1.4	.540	.00	-23.	12.	8.	123.92
1977	APR	1	30	-4.9	7.4	.660	.00	-45.	27.	7.	202.36
1977	MAY	1	31	4.9	13.3	.550	.00	-15.	38.	19.	214.34
1977	JUNE	1	30	6.2	16.5	.620	.00	26.	85.	46.	250.82
1977	JULY	1	31	8.6	17.6	.640	.00	76.	148.	81.	242.96
1977	AUG	1	31	6.0	13.7	.630	.00	115.	143.	97.	208.15
1977	SEPT	1	30	5.6	10.6	.360	.00	156.	129.	114.	105.89
1977	OCT	1	31	-1.9	6.1	.550	.00	151.	132.	101.	92.79
1977	NOV	1	30	-11.4	-6.3	.520	.00	129.	68.	68.	52.97
1977	DEC	1	31	-19.9	-17.1	.180	.00	125.	45.	45.	6.09
**** GLB6N =		144.7583	**** GLEND =		135.9437						

LAKE DIEFENBAKER MONTHLY TOTALS AVERAGED OVER 2 YEARS

MONTH	NET RAD.	EVAPORATION POTENT.	LAKE
JAN	65.1	31.0	31.0
FEB	7.4	12.7	12.7
MAR	-24.7	11.1	8.4
APR	-35.9	19.1	7.5
MAY	-19.7	35.6	16.5
JUNE	20.7	73.5	40.8
JULY	64.1	134.6	73.4
AUG	108.2	162.6	99.4
SEPT	149.4	136.9	110.5
OCT	155.7	133.2	103.4
NOV	149.3	72.1	72.1
DEC	131.2	51.1	51.1

TOTAL OF MONTHLY AVERAGES 771.0 873.4 626.7

$$S = (Saskatoon SRC + Swift Current A) / 2$$

CRAE Model

LAKE DIEFENBAKER PHID= 50.80 ALTI= 545.0 PPN= 349.00							NET EVAPOTRANSPIRATION		
YEAR	MONTH	STARTDAY	LENGTH	TD	T	S	RAD.	POTENT.	AREAL
1973	JAN	1	31	-14.2	-10.5	.480	-41.	-3.	-3.
1973	FEB	1	28	-14.3	-10.8	.440	-26.	-1.	-1.
1973	MAR	1	31	-4.8	.1	.550	44.	54.	22.
1973	APR	1	30	-2.9	2.4	.410	69.	70.	35.
1973	MAY	1	31	2.3	11.4	.580	136.	165.	61.
1973	JUNE	1	30	7.9	15.6	.570	148.	176.	87.
1973	JULY	1	31	8.3	17.9	.700	165.	219.	88.
1973	AUG	1	31	8.2	18.7	.670	121.	206.	41.
1973	SEPT	1	30	3.3	11.0	.530	55.	102.	15.
1973	OCT	1	31	-1.4	6.3	.540	9.	43.	11.
1973	NOV	1	30	-13.5	-11.2	.300	-24.	-3.	-3.
1973	DEC	1	31	-16.0	-13.2	.190	-28.	-2.	-2.
1977	JAN	1	31	-21.7	-17.7	.450	-39.	-2.	-2.
1977	FEB	1	28	-6.9	-4.1	.520	-19.	1.	1.
1977	MAR	1	31	-8.8	-1.4	.550	39.	54.	17.
1977	APR	1	30	-4.9	7.4	.660	104.	147.	19.
1977	MAY	1	31	4.9	13.3	.550	129.	165.	62.
1977	JUNE	1	30	6.2	16.5	.660	163.	213.	81.
1977	JULY	1	31	8.6	17.6	.620	151.	203.	80.
1977	AUG	1	31	6.0	13.7	.620	119.	154.	59.
1977	SEPT	1	30	5.6	10.6	.350	37.	70.	18.
1977	OCT	1	31	-1.9	6.1	.550	10.	44.	10.
1977	NOV	1	30	-11.4	-6.3	.550	-16.	7.	7.
1977	DEC	1	31	-19.9	-17.1	.240	-28.	-2.	-2.

LAKE DIEFENBAKER MONTHLY TOTALS AVERAGED OVER 2 YEARS

MONTH	NET EVAPOTRANSPIRATION		
	RAD.	POTENT.	AREAL
JAN	-39.6	-2.3	-2.3
FEB	-22.3	.3	.3
MAR	41.3	54.0	19.5
APR	86.3	108.6	26.8
MAY	132.6	165.0	61.5
JUNE	155.6	194.4	84.2
JULY	158.3	211.2	83.9
AUG	119.8	180.1	49.9
SEPT	45.8	86.0	16.6
OCT	9.3	43.5	10.6
NOV	-20.1	2.0	2.0
DEC	-28.0	-2.4	-2.4

TOTAL OF MONTHLY AVERAGES 639.0 1040.4 350.7

S = Swift Current A

CRAE model

LAKE DIEFENBAKER PHID= 50.80 ALTI= 545.0 PPN= 349.00							NET EVAPOTRANSPIRATION		
YEAR	MONTH	STARTDAY	LENGTH	TD	T	S	RAD.	POTENT.	AREAL
1973	JAN	1	31	-14.2	-10.5	.500	-41.	-3.	-3.
1973	FEB	1	28	-14.3	-10.8	.480	-26.	-1.	-1.
1973	MAR	1	31	-4.8	.1	.570	46.	54.	23.
1973	APR	1	30	-2.9	2.4	.400	67.	69.	34.
1973	MAY	1	31	2.3	11.4	.600	140.	167.	64.
1973	JUNE	1	30	7.9	15.6	.600	154.	180.	93.
1973	JULY	1	31	8.3	17.9	.770	178.	226.	100.
1973	AUG	1	31	8.2	18.7	.690	124.	207.	44.
1973	SEPT	1	30	3.3	11.0	.520	54.	101.	15.
1973	OCT	1	31	-1.4	6.3	.540	9.	43.	11.
1973	NOV	1	30	-13.5	-11.2	.290	-24.	-3.	-3.
1973	DEC	1	31	-16.0	-13.2	.180	-28.	-2.	-2.
1977	JAN	1	31	-21.7	-17.7	.400	-35.	-2.	-2.
1977	FEB	1	28	-6.9	-4.1	.540	-19.	1.	1.
1977	MAR	1	31	-8.8	-1.4	.540	38.	54.	16.
1977	APR	1	30	-4.9	7.4	.660	104.	147.	19.
1977	MAY	1	31	4.9	13.3	.550	129.	165.	62.
1977	JUNE	1	30	6.2	16.5	.620	155.	208.	74.
1977	JULY	1	31	8.6	17.6	.640	155.	206.	83.
1977	AUG	1	31	6.0	13.7	.630	120.	155.	60.
1977	SEPT	1	30	5.6	10.6	.360	38.	72.	19.
1977	OCT	1	31	-1.9	6.1	.550	10.	44.	10.
1977	NOV	1	30	-11.4	-6.3	.520	-17.	7.	7.
1977	DEC	1	31	-19.9	-17.1	.180	-27.	-2.	-2.

LAKE DIEFENBAKER MONTHLY TOTALS AVERAGED OVER 2 YEARS

MONTH	NET EVAPOTRANSPIRATION		
	RAD.	POTENT.	AREAL
JAN	-38.1	-2.1	-2.1
FEB	-22.3	.3	.3
MAR	41.9	53.9	20.0
APR	85.4	108.3	26.3
MAY	134.6	166.1	63.2
JUNE	154.6	193.9	83.3
JULY	166.5	216.0	91.4
AUG	122.1	181.4	51.9
SEPT	45.8	86.1	16.6
OCT	9.3	43.5	10.6
NOV	-20.4	2.0	2.0
DEC	-28.0	-2.4	-2.4

TOTAL OF MONTHLY AVERAGES	651.5	1046.8	361.0

APPENDIX D-1

Evaporation forecast for Lake Diefenbaker - method I

GCM-derived temperature estimates for Lake Diefenbaker D-1-1

CRLE results

GISS grid temperature estimates, calculated dew point temperature

Average lake depth DA = 40 m D-1-2

Upper lake depth DA = 20 m D-1-3

Lower lake depth DA = 50 m D-1-4

GFDL (GISS grid) temperature estimates, calculated dew point

temperature

Average lake depth DA = 40 m D-1-5

Upper lake depth DA = 20 m D-1-6

Lower lake depth DA = 50 m D-1-7

CRAE results

GISS grid temperature estimates, calculated dew point temperature D-1-8

GFDL (GISS grid) temperature estimates, calculated dew point temperature D-1-9

GCM-derived temperature estimates for Lake Diefenbaker

$T = (T \text{ at grid point } 50N110W + T \text{ at grid point } 50N105W) / 2$
 Estimates for 2xCO2 (degC)

	GISS grid	GFDL (GISS grid)
JAN	-8.5	-14.4
FEB	-5.0	-10.1
MAR	-1.1	-2.6
APR	8.3	9.8
MAY	14.5	14.5
JUN	19.6	16.7
JUL	22.4	18.9
AUG	23.0	19.8
SEP	17.4	13.1
OCT	11.4	8.3
NOV	2.8	-1.3
DEC	-4.3	-9.3

GISS grid Temperature estimates
Average Lake depth DA = 40m

CRLE model

LAKE DIEFENBAKER		PHID= 50.80	ALTI= 545.0	DA= 40.0	SALT=	.00	NET	EVAPORATION			
YEAR	MONTH	STARTDAY	LENGTH	TD	T	S	HADD	RAD.	POTENT.	LAKE	GW(W/M*M)
EST	JAN	1	31	-11.9	-8.5	.460	.00	30.	25.	25.	18.76
EST	FEB	1	28	-7.9	-5.0	.480	.00	-8.	4.	4.	42.15
EST	MAR	1	31	-7.2	-1.1	.550	.00	-31.	8.	5.	124.76
EST	APR	1	30	-3	8.3	.530	.00	-31.	24.	9.	171.90
EST	MAY	1	31	5.4	14.3	.560	.00	3.	50.	29.	216.66
EST	JUNE	1	30	10.4	19.6	.610	.00	50.	121.	66.	240.44
EST	JULY	1	31	12.8	22.4	.660	.00	99.	188.	108.	239.27
EST	AUG	1	31	13.5	23.0	.640	.00	138.	214.	138.	199.03
EST	SEPT	1	30	10.8	17.4	.440	.00	161.	172.	135.	118.56
EST	OCT	1	31	3.2	11.4	.540	.00	140.	151.	107.	89.74
EST	NOV	1	30	.0	2.8	.420	.00	112.	70.	70.	43.61
EST	DEC	1	31	-6.0	-4.3	.210	.00	98.	58.	58.	7.90
**** GLBGN =		110.5350	**** BLEND =		110.5350						

LAKE DIEFENBAKER MONTHLY TOTALS AVERAGED OVER 1 YEARS

MONTH	NET RAD.	EVAPORATION POTENT.	LAKE
JAN	30.1	24.7	24.7
FEB	-7.6	3.9	3.9
MAR	-30.8	7.9	5.1
APR	-30.7	24.4	9.5
MAY	2.6	50.3	28.8
JUNE	50.5	121.1	66.0
JULY	99.2	188.2	108.1
AUG	138.1	214.0	137.8
SEPT	160.5	171.8	135.1
OCT	139.8	150.7	107.3
NOV	111.6	69.9	69.9
DEC	98.1	57.7	57.7
TOTAL OF MONTHLY AVERAGES	761.4	1084.6	753.9

GISS grid Temperature estimates
Upper lake depth DA=20 m

CRLE model

LAKE DIEFENBAKER		PHID= 50.80	ALTI= 545.0	DA= 20.0	SALT=	.00	NET	EVAPORATION			
YEAR	MONTH	STARTDAY	LENGTH	TD	T	S	HADD	RAD.	POTENT.	LAKE	GM(W/M*H)
EST	JAN	1	31	-11.9	-8.5	.460	.00	2.	6.	6.	18.76
EST	FEB	1	28	-7.9	-5.0	.480	.00	-25.	-1.	-1.	42.15
EST	MAR	1	31	-7.2	-1.1	.550	.00	-39.	6.	3.	124.76
EST	APR	1	30	-.3	8.3	.530	.00	-22.	28.	13.	171.90
EST	MAY	1	31	5.4	14.3	.560	.00	27.	78.	43.	216.66
EST	JUNE	1	30	10.4	19.6	.610	.00	79.	157.	86.	240.44
EST	JULY	1	31	12.8	22.4	.660	.00	128.	206.	129.	239.27
EST	AUG	1	31	13.5	23.0	.640	.00	150.	228.	154.	199.03
EST	SEPT	1	30	10.8	17.4	.440	.00	168.	176.	141.	118.56
EST	OCT	1	31	3.2	11.4	.540	.00	128.	145.	100.	89.74
EST	NOV	1	30	.0	2.8	.420	.00	89.	58.	58.	43.61
EST	DEC	1	31	-6.0	-4.3	.210	.00	72.	45.	45.	7.90
**** GLBGN =		84.3479		**** GLEND =		84.3479					

LAKE DIEFENBAKER MONTHLY TOTALS AVERAGED OVER 1 YEARS

MONTH	NET RAD.	EVAPORATION POTENT.	LAKE
JAN	1.5	6.3	6.3
FEB	-24.7	-.8	-.8
MAR	-38.7	5.6	2.7
APR	-21.9	27.6	12.9
MAY	27.1	78.0	43.4
JUNE	79.0	156.7	86.2
JULY	127.9	205.9	128.8
AUG	159.7	227.7	153.8
SEPT	168.2	176.4	140.6
OCT	127.9	144.6	100.0
NOV	88.5	58.0	58.0
DEC	71.6	45.1	45.1
TOTAL OF MONTHLY AVERAGES	766.3	1131.1	<u>777.2</u>

GISS grid temperature estimates
 Lower lake depth DA=50m

CRLE model

RESGISS.C

LAKE DIEFENBAKER		PHID= 50.80	ALTI= 545.0	DA= 50.0	SALT=	.00	NET	EVAPORATION		PAGE 1	
YEAR	MONTH	STARTDAY	LENGTH	TD	T	S	HADD	RAD.	POTENT.	LAKE	GW(W/M*H)
EST	JAN	1	31	-11.9	-8.5	.460	.00	58.	34.	34.	18.76
EST	FEB	1	28	-7.9	-5.0	.480	.00	11.	14.	14.	42.15
EST	MAR	1	31	-7.2	-1.1	.550	.00	-19.	12.	9.	124.76
EST	APR	1	30	-3	8.3	.530	.00	-33.	24.	9.	171.90
EST	MAY	1	31	5.4	14.3	.560	.00	-15.	41.	20.	216.66
EST	JUNE	1	30	10.4	19.6	.610	.00	25.	89.	49.	240.44
EST	JULY	1	31	12.8	22.4	.660	.00	71.	162.	88.	239.27
EST	AUG	1	31	13.5	23.0	.640	.00	114.	199.	120.	199.03
EST	SEPT	1	30	10.8	17.4	.440	.00	148.	164.	126.	118.56
EST	OCT	1	31	3.2	11.4	.540	.00	144.	153.	110.	89.74
EST	NOV	1	30	.0	2.8	.420	.00	129.	79.	79.	43.61
EST	DEC	1	31	-6.0	-4.3	.210	.00	122.	70.	70.	7.90
**** GLBGN =		135.0287		**** GLEND =		135.0289					

LAKE DIEFENBAKER MONTHLY TOTALS AVERAGED OVER 1 YEARS

MONTH	NET RAD.	EVAPORATION POTENT.	LAKE
JAN	57.7	34.4	34.4
FEB	11.3	13.7	13.7
MAR	-18.6	11.5	8.9
APR	-32.9	23.7	8.6
MAY	-15.4	40.8	19.7
JUNE	25.4	88.7	48.6
JULY	71.0	161.9	87.6
AUG	114.0	198.9	120.1
SEPT	147.8	164.2	126.1
OCT	144.3	153.1	110.2
NOV	128.8	79.1	79.1
DEC	121.7	69.6	69.6
TOTAL OF MONTHLY AVERAGES	755.1	1039.5	726.8

D-1-4

GFDL (GISS grid) Temperature estimates
Average lake depth DA=40m

CRLE model

LAKE DIEFENBAKER		PHID= 50.80	ALTI= 545.0	DA= 40.0	SALT=	.00	NET	EVAPORATION			
YEAR	MONTH	STARTDAY	LENGTH	TD	T	S	HADD	RAD.	POTENT.	LAKE	GW(W/MEM)
EST	JAN	1	31	-18.3	-14.4	.460	.00	36.	23.	23.	14.21
EST	FEB	1	28	-13.5	-10.1	.480	.00	-5.	3.	3.	30.84
EST	MAR	1	31	-8.8	-2.6	.550	.00	-32.	7.	5.	125.38
EST	APR	1	30	1.1	9.8	.530	.00	-36.	25.	8.	171.15
EST	MAY	1	31	5.6	14.5	.560	.00	-1.	47.	27.	216.52
EST	JUNE	1	30	7.7	16.7	.610	.00	46.	105.	58.	246.33
EST	JULY	1	31	9.5	18.9	.660	.00	94.	168.	96.	245.37
EST	AUG	1	31	10.5	19.8	.640	.00	135.	195.	127.	203.03
EST	SEPT	1	30	6.7	13.1	.440	.00	160.	152.	123.	121.21
EST	OCT	1	31	.3	8.3	.540	.00	144.	138.	102.	90.85
EST	NOV	1	30	-4.1	-1.3	.420	.00	115.	73.	73.	44.08
EST	DEC	1	31	-11.5	-9.3	.210	.00	101.	50.	50.	7.04
**** GLBGN =		112.4283		**** GLEND =		112.4283					

LAKE DIEFENBAKER MONTHLY TOTALS AVERAGED OVER 1 YEARS

MONTH	NET RAD.	EVAPORATION POTENT.	LAKE
JAN	35.6	22.8	22.8
FEB	-5.3	3.1	3.1
MAR	-32.3	6.6	4.9
APR	-35.6	24.7	7.9
MAY	-1.5	47.2	26.8
JUNE	45.6	105.3	57.8
JULY	94.0	167.8	96.2
AUG	135.2	195.4	126.9
SEPT	159.7	152.2	123.1
OCT	143.9	137.7	101.9
NOV	115.4	72.6	72.6
DEC	100.8	50.1	50.1
TOTAL OF MONTHLY AVERAGES	755.5	985.6	694.1

GFDL (GISS grid) temperature estimates
 Upper lake depth DA = 20 m

CRLE model

LAKE DIEFENBAKER		PHID= 50.80	ALTI= 545.0	DA= 20.0	SALT=	.00	NET	EVAPORATION			
YEAR	MONTH	STARTDAY	LENGTH	TD	T	S	HADD	RAD.	POTENT.	LAKE	GN(W/M*M)
EST	JAN	1	31	-18.3	-14.4	.460	.00	6.	6.	6.	14.21
EST	FEB	1	28	-13.5	-10.1	.480	.00	-23.	-1.	-1.	30.84
EST	MAR	1	31	-8.8	-2.6	.550	.00	-42.	4.	2.	125.38
EST	APR	1	30	1.1	9.8	.530	.00	-28.	28.	11.	171.15
EST	MAY	1	31	5.6	14.5	.560	.00	24.	75.	42.	216.52
EST	JUNE	1	30	7.7	16.7	.610	.00	75.	141.	78.	246.33
EST	JULY	1	31	9.5	18.9	.660	.00	124.	185.	117.	245.37
EST	AUG	1	31	10.5	19.8	.640	.00	159.	209.	143.	203.03
EST	SEPT	1	30	6.7	13.1	.440	.00	168.	157.	129.	121.21
EST	OCT	1	31	.3	8.3	.540	.00	132.	132.	95.	90.85
EST	NOV	1	30	-4.1	-1.3	.420	.00	92.	60.	60.	44.08
EST	DEC	1	31	-11.5	-9.3	.210	.00	74.	39.	39.	7.04
**** GLBGN =		85.6856		**** BLEND =		85.6856					

LAKE DIEFENBAKER MONTHLY TOTALS AVERAGED OVER 1 YEARS

MONTH	NET RAD.	EVAPORATION POTENT.	LAKE
JAN	5.8	5.8	5.8
FEB	-23.3	-.5	-.5
MAR	-42.1	4.0	2.3
APR	-27.5	27.6	11.2
MAY	24.0	75.0	41.8
JUNE	74.8	141.3	77.5
JULY	124.0	185.4	116.8
AUG	158.5	209.4	143.5
SEPT	168.2	156.9	128.8
OCT	132.1	132.1	95.0
NOV	92.0	60.0	60.0
DEC	73.6	39.3	39.3
TOTAL OF MONTHLY AVERAGES	760.2	1036.3	721.4

GFDL (G155 grid) temperature estimates
 Lower lake depth DA=50m

CRL E mode

LAKE DIEFENBAKER		PHID= 50.80	ALTI= 545.0	DA= 50.0	SALT=	.00	NET	EVAPORATION			
YEAR	MONTH	STARTDAY	LENGTH	TD	T	S	HADD	RAD.	POTENT.	LAKE	GW(W/M*H)
EST	JAN	1	31	-18.3	-14.4	.460	.00	64.	30.	30.	14.21
EST	FEB	1	28	-13.5	-10.1	.480	.00	17.	18.	18.	30.84
EST	MAR	1	31	-8.8	-2.6	.550	.00	-19.	10.	9.	125.38
EST	APR	1	30	1.1	9.8	.530	.00	-37.	24.	7.	171.15
EST	MAY	1	31	5.6	14.5	.560	.00	-20.	39.	18.	216.52
EST	JUNE	1	30	7.7	16.7	.610	.00	20.	74.	41.	246.33
EST	JULY	1	31	9.5	18.9	.660	.00	65.	140.	76.	245.37
EST	AUG	1	31	10.5	19.8	.640	.00	110.	180.	109.	203.03
EST	SEPT	1	30	6.7	13.1	.440	.00	146.	145.	114.	121.21
EST	OCT	1	31	.3	8.3	.540	.00	148.	140.	104.	90.85
EST	NOV	1	30	-4.1	-1.3	.420	.00	133.	82.	82.	44.08
EST	DEC	1	31	-11.5	-9.3	.210	.00	125.	60.	60.	7.04
**** GLBGN =		137.3704		**** GLEND =		137.3707					

LAKE DIEFENBAKER MONTHLY TOTALS AVERAGED OVER 1 YEARS

MONTH	NET RAD.	EVAPORATION POTENT.	LAKE
JAN	63.8	30.4	30.4
FEB	16.5	18.1	18.1
MAR	-18.5	10.4	9.0
APR	-36.8	24.3	7.5
MAY	-19.9	39.2	17.7
JUNE	20.1	74.3	41.1
JULY	64.6	139.6	75.9
AUG	109.5	180.1	108.9
SEPT	145.9	144.6	114.0
DCT	148.1	139.7	104.4
NOV	132.8	82.3	82.3
DEC	124.9	60.3	60.3
TOTAL OF MONTHLY AVERAGES	751.0	943.2	669.4

GISS grid temperature estimates

CRAE model

LAKE DIEFENBAKER PHID= 50.80 ALTI= 545.0 PPN= 349.00							NET EVAPOTRANSPIRATION		
YEAR	MONTH	STARTDAY	LENGTH	TD	T	S	RAD.	POTENT.	AREAL
EST	JAN	1	31	-11.9	-8.5	.460	-40.	-3.	-3.
EST	FEB	1	28	-7.9	-5.0	.480	-20.	1.	1.
EST	MAR	1	31	-7.2	-1.1	.550	39.	53.	18.
EST	APR	1	30	-.3	8.3	.530	84.	119.	25.
EST	MAY	1	31	5.4	14.3	.560	131.	175.	60.
EST	JUNE	1	30	10.4	19.6	.610	151.	211.	82.
EST	JULY	1	31	12.8	22.4	.660	156.	236.	84.
EST	AUG	1	31	13.5	23.0	.640	118.	214.	49.
EST	SEPT	1	30	10.8	17.4	.440	48.	109.	16.
EST	OCT	1	31	3.2	11.4	.540	7.	52.	9.
EST	NOV	1	30	.0	2.8	.420	-24.	5.	5.
EST	DEC	1	31	-6.0	-4.3	.210	-29.	-5.	-5.

LAKE DIEFENBAKER MONTHLY TOTALS AVERAGED OVER 1 YEARS

MONTH	NET RAD.	EVAPOTRANSPIRATION POTENT.	AREAL
JAN	-40.1	-3.1	-3.1
FEB	-20.4	.8	.8
MAR	38.6	52.9	18.3
APR	84.2	119.3	25.1
MAY	130.9	174.7	60.2
JUNE	151.2	211.2	82.1
JULY	155.6	236.2	83.5
AUG	117.9	214.1	49.2
SEPT	48.2	108.5	16.3
OCT	7.1	51.9	8.6
NOV	-24.3	5.0	5.0
DEC	-28.6	-4.5	-4.5

TOTAL OF MONTHLY AVERAGES	620.4	1167.0	341.4

GFDL(GISS grid) temperature estimates

CRAE model

1 LAKE DIEFENBAKER PHID= 50.80 ALTI= 545.0 PPN= 349.00							NET EVAPOTRANSPIRATION		
YEAR	MONTH	STARTDAY	LENGTH	TD	T	S	RAD.	POTENT.	AREAL
AVYR	JAN	1	31	-18.3	-14.4	.460	-40.	-2.	-2.
AVYR	FEB	1	28	-13.5	-10.1	.480	-25.	-1.	-1.
AVYR	MAR	1	31	-8.8	-2.6	.550	40.	50.	19.
AVYR	APR	1	30	1.1	9.8	.530	83.	125.	24.
AVYR	MAY	1	31	5.6	14.5	.560	131.	176.	60.
AVYR	JUNE	1	30	7.7	16.7	.610	154.	197.	83.
AVYR	JULY	1	31	9.5	18.9	.660	157.	217.	83.
AVYR	AUG	1	31	10.5	19.8	.640	117.	197.	48.
AVYR	SEPT	1	30	6.7	13.1	.440	46.	93.	16.
AVYR	OCT	1	31	.3	8.3	.540	8.	46.	10.
AVYR	NOV	1	30	-4.1	-1.3	.420	-20.	3.	3.
AVYR	DEC	1	31	-11.5	-9.3	.210	-29.	-4.	-4.

LAKE DIEFENBAKER MONTHLY TOTALS AVERAGED OVER 1 YEARS

MONTH	NET RAD.	EVAPOTRANSPIRATION POTENT.	AREAL
JAN	-40.1	-2.3	-2.3
FEB	-25.9	-.8	-.8
MAR	39.8	50.1	19.0
APR	83.4	125.7	23.7
MAY	130.9	175.7	60.2
JUNE	154.1	196.9	83.4
JULY	157.1	216.9	83.4
AUG	117.2	196.5	48.3
SEPT	46.2	93.2	16.3
OCT	8.0	46.4	9.7
NOV	-20.5	2.8	2.8
DEC	-29.1	-3.7	-3.7

TOTAL OF MONTHLY AVERAGES	620.9	1097.4	339.9

APPENDIX D-2

Evaporation forecast for Lake Diefenbaker - method II

Climatological data

Lake Diefenbaker - sunshine duration	D-2-1
GISS grid - temperature change	D-2-2
GFDL (GISS grid) - temperature change	D-2-3
Lake Diefenbaker - regional temperature shift	D-2-4
Lake Diefenbaker - relative humidity	D-2-5
GISS grid - three levels of calculated dew point temperature	D-2-6
GFDL (GISS grid) - three levels of calculated dew point temperature	D-2-7
<u>GISS grid temperature - regional shift</u>	
Calculated dew point temperature	D-2-8
90% of calculated dew point temperature	D-2-9
110% of calculated dew point temperature	D-2-10
<u>GFDL (GISS grid) temperature - regional shift</u>	
Calculated dew point temperature	D-2-11
90% of calculated dew point temperature	D-2-12
110% of calculated dew point temperature	D-2-13

LAKE DIEFENBAKER - sunshine duration

$S = (Saskatoon + Swift Current A) / 2$

	1973 sunshine ratio	1977 sunshine ratio	average sunshine ratio
JAN	.48	.45	.46
FEB	.44	.52	.48
MAR	.55	.55	.55
APR	.41	.66	.53
MAY	.58	.55	.56
JUN	.57	.66	.61
JUL	.70	.62	.66
AUG	.67	.62	.64
SEP	.53	.35	.44
OCT	.54	.55	.54
NOV	.30	.55	.42
DEC	.19	.24	.21

GISS Grid
 Temperature change (deg C)
 2xCO2

GRID POINT	50N110W	50N105W	54N111W	Average change
JAN	5.9	6.0	6.2	6.0
FEB	5.4	5.6	5.5	5.5
MAR	4.6	4.8	4.5	4.6
APR	4.0	4.1	3.8	4.0
MAY	3.6	3.7	3.5	3.6
JUN	3.3	3.3	3.3	3.3
JUL	3.3	3.3	3.3	3.3
AUG	4.0	4.0	3.8	3.9
SEP	4.8	5.0	4.6	4.8
OCT	5.3	5.6	5.2	5.4
NOV	5.5	5.9	5.8	5.7
DEC	5.8	6.0	6.2	6.0

GFDL (GISS Grid)
 Temperature change (deg C)
 2xCO2

GRID POINT	50N110W	50N105W	54N111W	Average change
JAN	-1.2	1.3	2.1	0.7
FEB	-0.3	1.1	2.8	1.2
MAR	2.1	3.1	5.1	3.4
APR	6.5	4.6	6.0	5.7
MAY	3.2	4.2	1.7	3.0
JUN	-0.4	1.3	-0.1	0.3
JUL	-0.5	0.2	0.2	0.0
AUG	-0.1	-0.3	2.0	0.5
SEP	0.0	1.2	2.7	1.3
OCT	1.3	2.3	3.1	3.2
NOV	1.0	2.9	2.3	2.1
DEC	0.8	1.0	1.8	1.2

LAKE DIEFENBAKER - regional temperature shift

$$T = (\text{Saskatoon A temp. normal} + \text{Swift Current A temp. normal}) / 2$$

	Saska- toon A	Swift Current A	Average	GISS Average Shift	GISS Forecast	GFDL Average Shift	GFDL Forecast
JAN	-17.2	-19.3	-18.5	6.0	-12.5	0.7	-17.8
FEB	-12.7	-14.6	-13.6	5.5	-8.1	1.2	-12.4
MAR	-6.7	-8.6	-7.6	4.6	-3.0	3.4	-4.2
APR	3.8	3.3	3.5	4.0	7.5	5.7	9.2
MAY	11.5	11.1	11.3	3.6	14.9	3.0	14.3
JUN	16.1	15.7	15.9	3.3	19.2	0.3	16.2
JUL	18.9	18.5	18.7	3.3	22.0	0.0	18.7
AUG	17.8	17.2	17.5	3.9	21.4	0.5	18.0
SEP	12.0	11.2	11.6	4.8	16.4	1.3	12.9
OCT	5.7	4.9	5.3	5.4	10.7	3.2	8.5
NOV	-4.6	-5.7	-5.1	5.7	0.6	2.1	-3.0
DEC	-12.1	-14.1	-13.1	6.0	-7.1	1.2	-11.9

LAKE DIEFENBAKER - relative humidity

$T = (\text{Saskatoon} + \text{Swift Current A})/2$

	Rel. Hum. 1973	Rel. Hum. 1977	Rel. Hum. Average
JAN	.820	.839	.830
FEB	.836	.840	.838
MAR	.695	.577	.636
APR	.679	.412	.546
MAY	.535	.567	.551
JUN	.601	.505	.553
JUL	.534	.555	.545
AUG	.504	.596	.550
SEP	.590	.712	.651
OCT	.577	.564	.571
NOV	.925	.712	.819
DEC	.901	.928	.915

GISS Grid

LAKE DIEFENBAKER - three levels of calculated
dew point temperature (deg C)

	100%	90%	110%
JAN	-16.224	-17.473	-15.081
FEB	-11.322	-12.627	-10.128
MAR	-9.277	-10.606	-8.061
APR	-1.040	-2.467	.265
MAY	5.977	4.465	7.361
JUN	10.030	8.467	11.461
JUL	12.410	10.817	13.869
AUG	11.992	10.404	13.446
SEP	9.833	8.273	11.262
OCT	2.566	1.096	3.912
NOV	-2.126	-3.539	-.833
DEC	-9.117	-10.448	-7.909

GFDL (GISS Grid)

LAKE DIEFENBAKER - three levels of calculated
dew point temperature (deg C)

	100%	90%	110%
JAN	-21.288	-22.481	-20.198
FEB	-16.001	-17.253	-14.856
MAR	-10.559	-11.873	-9.357
APR	.543	-.903	1.866
MAY	5.419	3.913	6.796
JUN	7.239	5.711	8.638
JUL	9.348	7.794	10.771
AUG	8.833	7.286	10.250
SEP	6.511	4.992	7.901
OCT	.507	-.938	1.830
NOV	-6.023	-7.390	-4.772
DEC	-14.398	-15.668	-13.310

GISS grid temperature - regional shift
 Calculated dew point temperature

CRLE model

LAKE DIEFENBAKER		PHID= 50.80	ALTI= 545.0	DA= 40.0	SALT=	.00	NET	EVAPORATION			GW(W/M*M)
YEAR	MONTH	STARTDAY	LENGTH	TD	T	S	HADD	RAD.	POTENT.	LAKE	
AVYR	JAN	1	31	-16.2	-12.5	.460	.00	33.	23.	23.	15.21
AVYR	FEB	1	28	-11.3	-8.1	.480	.00	-7.	3.	3.	34.21
AVYR	MAR	1	31	-9.3	-3.0	.550	.00	-32.	7.	5.	125.54
AVYR	APR	1	30	-1.0	7.5	.530	.00	-34.	22.	8.	172.29
AVYR	MAY	1	31	6.0	14.9	.560	.00	0.	49.	28.	216.24
AVYR	JUNE	1	30	10.0	19.2	.610	.00	49.	118.	64.	241.29
AVYR	JULY	1	31	12.4	22.0	.660	.00	98.	185.	106.	239.66
AVYR	AUG	1	31	12.0	21.4	.640	.00	135.	204.	131.	200.37
AVYR	SEPT	1	30	9.8	16.4	.440	.00	159.	167.	132.	119.52
AVYR	OCT	1	31	2.6	10.7	.540	.00	140.	148.	106.	89.99
AVYR	NOV	1	30	-2.1	.6	.420	.00	113.	66.	66.	44.07
AVYR	DEC	1	31	-9.1	-7.1	.210	.00	99.	53.	53.	7.33

**** GLBGM = 111.0800

**** GLEND = 111.0800

LAKE DIEFENBAKER MONTHLY TOTALS AVERAGED OVER 1 YEARS

MONTH	EVAPORATION		
	NET RAD.	POTENT.	LAKE
JAN	33.2	23.2	23.2
FEB	-6.6	3.3	3.3
MAR	-31.7	6.6	5.2
APR	-34.1	22.3	8.0
MAY	.1	48.8	28.0
JUNE	48.8	117.6	64.1
JULY	98.0	185.4	106.2
AUG	135.4	203.9	131.3
SEPT	159.5	166.7	131.8
OCT	140.4	147.6	105.9
NOV	112.5	66.4	66.4
DEC	98.7	53.0	53.0
<hr/>			
TOTAL OF MONTHLY AVERAGES	754.1	1044.7	726.6

GISS grid temperature - regional shift
 Calculated dew point temperature (90% of calculated humidity)

CRLE model

LAKE DIEFENBAKER		PHID= 50.80	ALTI= 545.0	DA= 40.0	SALT=	.00	NET	EVAPORATION		GW(W/M*H)	
YEAR	MONTH	STARTDAY	LENGTH	TD	T	S	HADD	RAD.	POTENT.		LAKE
AVYR	JAN	1	31	-17.5	-12.5	.460	.00	34.	24.	24.	19.83
AVYR	FEB	1	28	-12.6	-8.1	.480	.00	-5.	6.	6.	49.79
AVYR	MAR	1	31	-10.6	-3.0	.550	.00	-28.	10.	7.	126.14
AVYR	APR	1	30	-2.5	7.5	.530	.00	-28.	28.	11.	173.21
AVYR	MAY	1	31	4.5	14.9	.560	.00	4.	58.	32.	217.62
AVYR	JUNE	1	30	8.5	19.2	.610	.00	49.	123.	66.	243.08
AVYR	JULY	1	31	10.8	22.0	.660	.00	96.	200.	107.	241.66
AVYR	AUG	1	31	10.4	21.4	.640	.00	133.	218.	132.	202.08
AVYR	SEPT	1	30	8.3	16.4	.440	.00	158.	180.	132.	120.46
AVYR	OCT	1	31	1.1	10.7	.540	.00	140.	158.	106.	90.70
AVYR	NOV	1	30	-3.5	6.6	.420	.00	113.	71.	67.	44.43
AVYR	DEC	1	31	-10.4	-7.1	.210	.00	99.	53.	53.	10.98

**** GLBGN = 111.9998

**** GLEND = 111.9998

LAKE DIEFENBAKER MONTHLY TOTALS AVERAGED OVER 1 YEARS

MONTH	NET RAD.	EVAPORATION POTENT.	LAKE
JAN	34.1	23.6	23.6
FEB	-5.2	5.9	5.9
MAR	-28.2	9.8	6.7
APR	-28.4	27.5	11.2
MAY	3.8	57.7	31.6
JUNE	48.9	123.3	65.7
JULY	96.2	200.3	107.0
AUG	133.4	218.0	131.6
SEPT	158.1	179.7	131.9
OCT	140.4	157.8	106.4
NOV	112.9	71.4	66.9
DEC	99.1	53.3	53.3

TOTAL OF MONTHLY AVERAGES 765.1 1128.3 741.9

GISS grid temperature - regional shift
 Calculated dew point temperature (110% of calculated humidity)

CRLE model

LAKE DIEFENBAKER		PHID= 50.80	ALTI= 545.0	DA= 40.0	SALT=	.00	NET	EVAPORATION			
YEAR	MONTH	STARTDAY	LENGTH	TD	T	S	HADD	RAD.	POTENT.	LAKE	GW(W/M*M)
AVYR	JAN	1	31	-15.1	-12.5	.460	.00	32.	23.	23.	12.35
AVYR	FEB	1	28	-10.1	-8.1	.480	.00	-8.	0.	0.	24.75
AVYR	MAR	1	31	-8.1	-3.0	.550	.00	-36.	3.	3.	124.96
AVYR	APR	1	30	.3	7.5	.530	.00	-38.	17.	5.	171.42
AVYR	MAY	1	31	7.4	14.9	.560	.00	-2.	43.	25.	214.93
AVYR	JUNE	1	30	11.5	19.2	.610	.00	50.	113.	63.	239.59
AVYR	JULY	1	31	13.9	22.0	.660	.00	100.	171.	106.	237.75
AVYR	AUG	1	31	13.4	21.4	.640	.00	138.	190.	131.	198.74
AVYR	SEPT	1	30	11.3	15.4	.440	.00	161.	154.	132.	118.62
AVYR	OCT	1	31	3.9	10.7	.540	.00	140.	138.	105.	89.32
AVYR	NOV	1	30	-.8	.6	.420	.00	124.	72.	72.	26.03
AVYR	DEC	1	31	-8.0	-7.1	.210	.00	96.	52.	52.	6.19

**** GLBGM = 106.4232

**** GLEND = 106.4232

LAKE DIEFENBAKER MONTHLY TOTALS AVERAGED OVER 1 YEARS

MONTH	NET RAD.	EVAPORATION POTENT.	LAKE
JAN	32.4	22.9	22.9
FEB	-8.2	.4	.4
MAR	-35.9	2.9	2.9
APR	-38.3	17.2	5.4
MAY	-1.9	42.8	25.4
JUNE	49.6	112.7	63.1
JULY	100.2	171.2	105.8
AUG	137.6	190.3	131.3
SEPT	161.0	154.1	131.7
OCT	140.5	137.6	105.4
NOV	124.3	72.2	72.2
DEC	96.1	51.8	51.8

TOTAL OF MONTHLY AVERAGES 757.4 976.0 718.2

GFDL (GISS grid) temperature - regional shift
 Calculated dew point temperature

CRLE model

LAKE DIEFENBAKER		PHID= 50.80	ALTI= 545.0	DA= 40.0	SALT=	.00	NET	EVAPORATION		GW(M/M*H)	
YEAR	MONTH	STARTDAY	LENGTH	TD	T	S	HADD	RAD.	POTENT.		LAKE
AVYR	JAN	1	31	-21.3	-17.2	.460	.00	36.	21.	21.	13.24
AVYR	FEB	1	28	-16.0	-12.4	.480	.00	-6.	3.	3.	28.13
AVYR	MAR	1	31	-10.6	-4.2	.550	.00	-33.	6.	5.	126.01
AVYR	APR	1	30	.5	9.2	.530	.00	-37.	23.	7.	171.45
AVYR	MAY	1	31	5.4	14.3	.560	.00	-3.	46.	26.	216.66
AVYR	JUNE	1	30	7.2	16.2	.610	.00	45.	103.	57.	247.27
AVYR	JULY	1	31	9.3	18.7	.660	.00	94.	167.	96.	245.80
AVYR	AUG	1	31	8.8	18.0	.640	.00	134.	185.	121.	206.33
AVYR	SEPT	1	30	6.5	12.9	.440	.00	160.	152.	123.	121.29
AVYR	OCT	1	31	.5	8.5	.540	.00	145.	139.	103.	90.78
AVYR	NOV	1	30	-6.0	-3.0	.420	.00	117.	70.	70.	37.24
AVYR	DEC	1	31	-14.4	-11.9	.210	.00	101.	46.	46.	6.83

**** GLBGN = 111.3333

**** GLEND = 111.3334

LAKE DIEFENBAKER MONTHLY TOTALS AVERAGED OVER 1 YEARS

MONTH	NET RAD.	EVAPORATION POTENT.	LAKE
JAN	35.8	21.4	21.4
FEB	-5.8	2.5	2.5
MAR	-33.0	5.6	5.2
APR	-37.2	23.3	7.2
MAY	-2.6	46.3	26.1
JUNE	44.9	102.8	56.6
JULY	93.8	166.8	95.6
AUG	133.7	185.1	120.9
SEPT	160.3	151.6	123.0
OCT	145.3	139.3	103.2
NOV	117.0	69.8	69.8
DEC	101.2	45.8	45.8

TOTAL OF MONTHLY AVERAGES	753.3	960.5	<u>677.1</u>

SFDL (GISS grid) temperature - regional shift
 Calculated dew point temperature (90% of calculated humidity)

CRLE model

LAKE DIEFENBAKER PHID= 50.80 ALTI= 545.0 DA= 40.0 SALT= .00											
YEAR	MONTH	STARTDAY	LENGTH	TD	T	S	HADD	NET RAD.	EVAPORATION POTENT.	LAKE	GW(W/M*H)
AVYR	JAN	1	31	-22.5	-17.2	.460	.00	39.	22.	22.	15.27
AVYR	FEB	1	28	-17.3	-12.4	.480	.00	-3.	5.	5.	35.73
AVYR	MAR	1	31	-11.9	-4.2	.550	.00	-30.	8.	6.	126.59
AVYR	APR	1	30	-9	9.2	.530	.00	-35.	28.	9.	172.41
AVYR	MAY	1	31	3.9	14.3	.560	.00	-2.	51.	28.	218.01
AVYR	JUNE	1	30	5.7	16.2	.610	.00	44.	107.	57.	248.93
AVYR	JULY	1	31	7.8	18.7	.660	.00	92.	180.	96.	247.64
AVYR	AUG	1	31	7.3	18.0	.640	.00	132.	198.	121.	207.90
AVYR	SEPT	1	30	5.0	12.9	.440	.00	159.	163.	123.	122.15
AVYR	OCT	1	31	-9	8.5	.540	.00	145.	149.	104.	91.45
AVYR	NOV	1	30	-7.4	-3.0	.420	.00	118.	70.	70.	45.18
AVYR	DEC	1	31	-15.7	-11.9	.210	.00	103.	46.	46.	8.46

**** GLBGN = 113.7985

**** GLEND = 113.7985

LAKE DIEFENBAKER MONTHLY TOTALS AVERAGED OVER 1 YEARS

MONTH	NET RAD.	EVAPORATION POTENT.	LAKE
JAN	39.0	22.1	22.1
FEB	-3.2	4.6	4.6
MAR	-30.5	8.4	6.3
APR	-34.7	27.9	9.3
MAY	-1.6	51.4	28.1
JUNE	44.3	107.0	57.4
JULY	92.2	179.9	96.1
AUG	132.2	197.8	121.2
SEPT	159.5	163.2	123.2
OCT	145.4	148.6	103.7
NOV	117.5	70.1	70.1
DEC	102.7	46.3	46.3

TOTAL OF MONTHLY AVERAGES	762.9	1027.4	<u>688.4</u>

GFDL (GISS grid) temperature - regional shift
 Calculated dew point temperature (110% of calculated humidity)

CRLE model

LAKE DIEFENBAKER		PHID= 50.80	ALT1= 545.0	DA= 40.0	SALT=	.00	NET	EVAPORATION			
YEAR	MONTH	STARTDAY	LENGTH	TD	T	S	HADD	RAD.	POTENT.	LAKE	GW(M/M*H)
AVYR	JAN	1	31	-20.2	-17.2	.460	.00	35.	21.	21.	11.99
AVYR	FEB	1	28	-14.9	-12.4	.480	.00	-7.	0.	0.	23.58
AVYR	MAR	1	31	-9.4	-4.2	.550	.00	-36.	3.	3.	125.46
AVYR	APR	1	30	1.9	9.2	.530	.00	-39.	19.	5.	170.53
AVYR	MAY	1	31	6.8	14.3	.560	.00	-3.	41.	24.	215.37
AVYR	JUNE	1	30	8.6	16.2	.610	.00	46.	99.	56.	245.70
AVYR	JULY	1	31	10.8	18.7	.660	.00	96.	154.	95.	244.05
AVYR	AUG	1	31	10.3	18.0	.640	.00	135.	173.	121.	204.84
AVYR	SEPT	1	30	7.9	12.9	.440	.00	161.	140.	123.	120.48
AVYR	OCT	1	31	1.8	8.5	.540	.00	145.	130.	103.	90.15
AVYR	NOV	1	30	-4.8	-3.0	.420	.00	128.	75.	75.	20.89
AVYR	DEC	1	31	-13.3	-11.9	.210	.00	99.	45.	45.	6.32

**** GLBGN = 107.1078

**** GLEND = 107.1078

LAKE DIEFENBAKER MONTHLY TOTALS AVERAGED OVER 1 YEARS

MONTH	NET RAD.	EVAPORATION POTENT.	LAKE
JAN	35.2	21.2	21.2
FEB	-7.1	.5	.5
MAR	-35.9	2.6	2.6
APR	-38.9	18.7	5.2
MAY	-2.8	41.3	24.5
JUNE	45.9	99.0	56.0
JULY	95.6	154.0	95.2
AUG	135.3	172.8	120.8
SEPT	161.2	140.4	122.9
OCT	145.2	130.2	102.8
NOV	127.8	75.5	75.5
DEC	98.7	44.9	44.9

TOTAL OF MONTHLY AVERAGES	760.2	901.1	<u>672.0</u>

D-2-13

APPENDIX E

Evaluation of relative humidity and sunshine ratio extremes

Relative humidity data

Extreme values of relative humidity

E-1

Sunshine ratio data

Additional sunshine ratio data - 1978

E-2

Additional sunshine ratio data - 1979

E-3

Additional sunshine ratio data - 1980

E-4

Additional sunshine ratio data - 1981

E-5

Additional sunshine ratio data - average FOR 1978-1981

E-6

Extreme values of sunshine ratio

E-7

Extreme values of relative humidity

	Data minimum	Data maximum	Limit minimum	Limit maximum
JAN	.037	.890	.050	.900
FEB	.820	.862	.050	.900
MAR	.546	.745	.400	.750
APR	.397	.721	.400	.750
MAY	.519	.565	.400	.750
JUN	.492	.657	.400	.750
JUL	.482	.590	.400	.750
AUG	.459	.605	.400	.750
SEP	.582	.737	.400	.750
OCT	.544	.602	.400	.750
NOV	.203	.881	.050	.900
DEC	.044	.882	.050	.900

Additional sunshine ratio data - 1978

	Calgary A	Leth- bridge CDA	Medicine Hat A	Outlook PFRA	Swift Current A
JAN	.33	.27	.30	.40	.33
FEB	.46	.36	.35	.35	.24
MAR	.44	.36	.46	.44	.42
APR	.31	.25	.32	.48	.41
MAY	.51	.47	.53	.56	.56
JUN	.67	.69	.72	.70	.70
JUL	.57	.61	.66	.68	.67
AUG	.63	.66	.72	.67	.70
SEP	.47	.46	.53	.45	.50
OCT	.68	.53	.59	.61	.60
NOV	.45	.36	.37	.34	.36
DEC	.42	.28	.38	.40	.33

Additional sunshine ratio data - 1979

	Calgary A	Leth- bridge CDA	Medicine Hat A	Outlook PFRA	Swift Current A
JAN	.59	.43	.42	.43	.41
FEB	.42	.35	.42	.40	.34
MAR	.51	.39	.51	.45	.45
APR	.39	.40	.42	.38	.38
MAY	.49	.49	.54	.56	.56
JUN	.62	.66	.71	.63	.68
JUL	.70	.70	.72	.65	.68
AUG	.65	.68	.69	.70	.66 1)
SEP	.64	.70	.69	.62	---
OCT	.48	.47	---	.46	.47 1)
NOV	.53	.47	---	.42	---
DEC	.43	.35	.39	.43	.50

1) Swift Current CDA

Additional sunshine ratio data - 1980

	Calgary A	Leth- bridge CDA	Medicine Hat A	Outlook PFRA	Swift Current A
JAN	.52	.37	.45	.41	.35
FEB	.46	.38	.54	.50	.46
MAR	.49	.44	.51	.39	.36
APR	.66	.59	.66	.67	.70
MAY	.60	.61	.70	.78	.77
JUN	.51	.62	.61	.59	.58
JUL	.71	.72	.77	.71	.72
AUG	.54	.54	.60	.57	.59
SEP	.49	.45	.55	.45	.48
OCT	.58	.50	.52	.50	.50
NOV	.52	.44	.49	.45	.45
DEC	.31	.18	.25	.28	.30

Additional sunshine ratio data - 1981

	Calgary A	Leth- bridge CDA	Medicine Hat A	Outlook PFRA	Swift Current A
JAN	.28	.40	.53	.62	.57
FEB	.50	.46	.38	.55	---
MAR	.46	.52	.48	.55	.57
APR	.56	.62	.54	.58	.65
MAY	.55	.55	.44	.41	.53
JUN	.58	.57	.62	.58	.65
JUL	.60	.68	.62	.53	.71
AUG	.67	.75	.79	.74	.78
SEP	.51	.62	.61	.61	.65
OCT	.35	.43	.42	.44	.46
NOV	.47	.56	.56	.49	.53
DEC	.50	.29	.46	.51	.39

Additional sunshine ratio data - average for 1978-1981

	Calgary A		Leth- bridge CDA		Medicine Hat A		Outlook PFRA		Swift Current A		Average
	\bar{x}	s	\bar{x}	s	\bar{x}	s	\bar{x}	s	\bar{x}	s	
JAN	.52	.13	.40	.11	.44	.11	.38	.07	.37	.04	.42
FEB	.47	.05	.37	.02	.44	.10	.44	.08	.38	.11	.42
MAR	.50	.05	.42	.05	.51	.05	.44	.03	.44	.07	.46
APR	.49	.16	.45	.15	.51	.17	.52	.12	.53	.16	.50
MAY	.50	.08	.50	.07	.58	.08	.61	.11	.61	.11	.56
JUN	.60	.07	.65	.03	.67	.05	.63	.05	.63	.07	.64
JUL	.63	.09	.66	.06	.72	.05	.66	.05	.69	.02	.67
AUG	.64	.08	.67	.10	.70	.08	.65	.06	.68	.07	.67
SEP	.55	.08	.56	.12	.61	.08	.51	.08	.53	.08	.55
OCT	.55	.11	.48	.05	.52	.07	.48	.11	.50	.07	.51
NOV	.50	.04	.46	.08	.46	.08	.41	.05	.46	.10	.46
DEC	.42	.08	.32	.12	.35	.07	.35	.07	.36	.10	.36

Extreme values of sunshine ratio

	Data minimum	Data maximum
JAN	.37	.52
FEB	.37	.47
MAR	.42	.50
APR	.45	.53
MAY	.50	.61
JUN	.60	.67
JUL	.63	.72
AUG	.64	.70
SEP	.51	.61
OCT	.48	.55
NOV	.41	.50
DEC	.32	.42

APPENDIX F

Testing of influence of relative humidity and sunshine ratio

using CRAE model

GISS grid point 50N115W

Relative humidity low, sunshine ratio low	F-1
Relative humidity low, sunshine ratio high	F-2
Relative humidity high, sunshine ratio low	F-3
Relative humidity high, sunshine ratio high	F-4

GISS grid point 50N110W

Relative humidity low, sunshine ratio low	F-5
Relative humidity low, sunshine ratio high	F-6
Relative humidity high, sunshine ratio low	F-7
Relative humidity high, sunshine ratio high	F-8

Relative humidity low, sunshine ratio low

GISS 50N115W NORM AA PHID= 50.00 ALTI= 1500.0 PPN= 727.00

YEAR	MONTH	STARTDAY	LENGTH	RELH	T	S	NET EVAPOTRANSPIRATION		
							RAD.	POTENT.	AREAL
AVYR	JAN	1	31	.1	-10.5	.370	-20.	15.	8.
AVYR	FEB	1	28	.1	-7.5	.370	-1.	21.	10.
AVYR	MAR	1	31	.4	-5.0	.420	35.	49.	14.
AVYR	APR	1	30	.4	4.0	.450	80.	116.	15.
AVYR	MAY	1	31	.4	11.7	.500	124.	193.	32.
AVYR	JUNE	1	30	.4	10.0	.600	162.	198.	67.
AVYR	JULY	1	31	.4	13.0	.630	162.	222.	63.
AVYR	AUG	1	31	.4	13.0	.640	127.	203.	33.
AVYR	SEPT	1	30	.4	9.0	.510	57.	114.	9.
AVYR	OCT	1	31	.4	3.5	.480	11.	50.	8.
AVYR	NOV	1	30	.1	-5.0	.410	-15.	23.	4.
AVYR	DEC	1	31	.1	-7.5	.320	-28.	18.	4.

GISS 50N115W NORM AA MONTHLY TOTALS AVERAGED OVER 1 YEARS

MONTH	NET EVAPOTRANSPIRATION		
	RAD.	POTENT.	AREAL
JAN	-19.6	15.4	8.5
FEB	-5	20.9	9.9
MAR	34.5	48.8	14.2
APR	79.6	116.4	14.7
MAY	124.0	193.4	31.7
JUNE	162.4	198.1	67.0
JULY	162.2	222.4	63.4
AUG	126.9	203.4	33.1
SEPT	56.9	113.9	9.0
OCT	11.5	50.3	8.0
NOV	-15.3	23.4	3.8
DEC	-27.9	17.9	3.5

TOTAL OF MONTHLY AVERAGES	694.9	1224.2	<u>266.8</u>

Relative humidity low, sunshine ratio high

GISS 50N115W NORM AB PHID= 50.00 ALTI= 1500.0 PPN= 727.00

YEAR	MONTH	STARTDAY	LENGTH	RELH	T	S	NET EVAPOTRANSPIRATION		
							RAD.	POTENT.	AREAL
AVYR	JAN	1	31	.1	-10.5	.520	-16.	16.	9.
AVYR	FEB	1	28	.1	-7.5	.470	5.	24.	10.
AVYR	MAR	1	31	.4	-5.0	.500	43.	56.	15.
AVYR	APR	1	30	.4	4.0	.530	94.	130.	18.
AVYR	MAY	1	31	.4	11.7	.610	148.	206.	52.
AVYR	JUNE	1	30	.4	10.0	.670	178.	206.	81.
AVYR	JULY	1	31	.4	13.0	.720	181.	233.	80.
AVYR	AUG	1	31	.4	13.0	.700	137.	209.	42.
AVYR	SEPT	1	30	.4	9.0	.610	69.	128.	10.
AVYR	OCT	1	31	.4	3.5	.550	16.	55.	8.
AVYR	NOV	1	30	.1	-5.0	.500	-13.	24.	5.
AVYR	DEC	1	31	.1	-7.5	.420	-27.	18.	4.

GISS 50N115W NORM AB MONTHLY TOTALS AVERAGED OVER 1 YEARS

MONTH	NET EVAPOTRANSPIRATION		
	RAD.	POTENT.	AREAL
JAN	-16.5	15.8	9.1
FEB	4.8	24.0	10.0
MAR	43.1	55.7	15.3
APR	93.8	129.5	17.8
MAY	148.2	206.0	51.9
JUNE	178.3	206.3	80.6
JULY	181.5	233.0	80.5
AUG	137.4	209.0	42.0
SEPT	69.4	128.1	10.5
OCT	16.4	54.8	8.3
NOV	-12.7	23.9	4.7
DEC	-27.3	18.0	3.6

TOTAL OF MONTHLY AVERAGES 816.4 1304.2 334.2

Relative humidity high, sunshine ratio low

GISS 50N115W NORM BA PHID= 50.00 ALTI= 1500.0 PPN= 727.00							NET EVAPOTRANSPIRATION		
YEAR	MONTH	STARTDAY	LENGTH	RELH	T	S	RAD.	POTENT.	AREAL
AVYR	JAN	1	31	.9	-10.5	.370	-24.	-2.	-2.
AVYR	FEB	1	28	.9	-7.5	.370	-12.	0.	0.
AVYR	MAR	1	31	.8	-5.0	.420	35.	34.	27.
AVYR	APR	1	30	.8	4.0	.450	81.	73.	55.
AVYR	MAY	1	31	.8	11.7	.500	129.	123.	99.
AVYR	JUNE	1	30	.8	10.0	.600	164.	135.	128.
AVYR	JULY	1	31	.8	13.0	.630	165.	149.	134.
AVYR	AUG	1	31	.8	13.0	.640	131.	128.	103.
AVYR	SEPT	1	30	.8	9.0	.510	61.	76.	42.
AVYR	OCT	1	31	.8	3.5	.480	14.	33.	20.
AVYR	NOV	1	30	.9	-5.0	.410	-23.	-3.	-3.
AVYR	DEC	1	31	.9	-7.5	.320	-25.	-3.	-3.

GISS 50N115W NORM BA MONTHLY TOTALS AVERAGED OVER 1 YEARS

MONTH	NET RAD.	EVAPOTRANSPIRATION POTENT.	AREAL
JAN	-23.6	-2.1	-2.1
FEB	-12.0	.3	.3
MAR	34.7	33.9	27.3
APR	81.4	72.8	55.2
MAY	128.6	122.5	99.2
JUNE	163.9	134.6	128.1
JULY	165.5	148.6	133.9
AUG	131.0	128.4	102.9
SEPT	61.0	76.2	42.0
OCT	14.2	33.0	19.9
NOV	-23.4	-2.7	-2.7
DEC	-25.4	-2.9	-2.9

TOTAL OF MONTHLY AVERAGES	695.9	742.8	<u>601.2</u>

Relative humidity high, sunshine ratio high

GISS 50N115W NORM BB PHID= 50.00 ALTI= 1500.0 PPN= 727.00							NET EVAPOTRANSPIRATION		
YEAR	MONTH	STARTDAY	LENGTH	RELH	T	S	RAD.	POTENT.	AREAL
AVYR	JAN	1	31	.9	-10.5	.520	-42.	-6.	-6.
AVYR	FEB	1	28	.9	-7.5	.470	-25.	-3.	-3.
AVYR	MAR	1	31	.8	-5.0	.500	43.	37.	32.
AVYR	APR	1	30	.8	4.0	.530	95.	79.	65.
AVYR	MAY	1	31	.8	11.7	.610	151.	135.	119.
AVYR	JUNE	1	30	.8	10.0	.670	179.	143.	141.
AVYR	JULY	1	31	.8	13.0	.720	183.	159.	150.
AVYR	AUG	1	31	.8	13.0	.700	141.	134.	111.
AVYR	SEPT	1	30	.8	9.0	.610	72.	82.	51.
AVYR	OCT	1	31	.8	3.5	.550	19.	37.	20.
AVYR	NOV	1	30	.9	-5.0	.500	-37.	-7.	-7.
AVYR	DEC	1	31	.9	-7.5	.420	-33.	-5.	-5.

GISS 50N115W NORM BB MONTHLY TOTALS AVERAGED OVER 1 YEARS

MONTH	NET RAD.	EVAPOTRANSPIRATION POTENT.	AREAL
JAN	-42.3	-6.1	-6.1
FEB	-25.4	-3.2	-3.2
MAR	42.9	36.9	32.0
APR	94.8	79.0	64.9
MAY	151.1	135.3	119.0
JUNE	178.9	143.0	141.4
JULY	183.4	159.2	150.4
AUG	140.7	134.1	111.5
SEPT	72.4	82.1	50.9
OCT	18.6	37.2	20.4
NOV	-36.7	-6.6	-6.6
DEC	-33.0	-4.8	-4.8

TOTAL OF MONTHLY AVERAGES 745.4 786.1 669.7

Relative humidity low, sunshine ratio low

N50110AA.RES

GISS 50N110W NORM AA PHID= 50.00 ALTI= 700.0 PPN= 390.00							NET EVAPOTRANSPIRATION		
YEAR	MONTH	STARTDAY	LENGTH	RELH	T	S	RAD.	POTENT.	AREAL
AVYR	JAN	1	31	.1	-12.0	.370	-21.	13.	10.
AVYR	FEB	1	28	.1	-8.5	.370	-2.	18.	10.
AVYR	MAR	1	31	.4	-4.0	.420	31.	46.	13.
AVYR	APR	1	30	.4	4.0	.450	76.	108.	13.
AVYR	MAY	1	31	.4	11.0	.500	120.	184.	24.
AVYR	JUNE	1	30	.4	16.4	.600	152.	232.	49.
AVYR	JULY	1	31	.4	19.2	.630	149.	256.	42.
AVYR	AUG	1	31	.4	19.0	.640	116.	235.	12.
AVYR	SEPT	1	30	.4	13.0	.510	51.	120.	5.
AVYR	OCT	1	31	.4	6.0	.480	7.	51.	6.
AVYR	NOV	1	30	.1	-2.0	.410	-20.	27.	0.
AVYR	DEC	1	31	.1	-9.0	.320	-29.	15.	5.

GISS 50N110W NORM AA MONTHLY TOTALS AVERAGED OVER 1 YEARS

MONTH	NET RAD.	EVAPOTRANSPIRATION POTENT.	AREAL
JAN	-20.6	13.0	10.1
FEB	-2.1	18.5	10.0
MAR	30.8	46.5	12.9
APR	75.8	107.9	13.5
MAY	120.1	183.6	24.0
JUNE	151.7	232.3	48.7
JULY	148.8	255.8	41.7
AUG	115.5	235.2	12.2
SEPT	51.3	119.9	5.4
OCT	6.8	50.5	5.6
NOV	-20.5	26.8	.0
DEC	-29.0	15.3	5.4

TOTAL OF MONTHLY AVERAGES	628.5	1305.4	189.5

Relative humidity low, sunshine ratio high

GISS 50N110W NORM AB PHID= 50.00 ALTI= 700.0 PPN= 390.00

YEAR	MONTH	STARTDAY	LENGTH	RELH	T	S	NET EVAPOTRANSPIRATION		
							RAD.	POTENT.	AREAL
AVYR	JAN	1	31	.1	-12.0	.520	-17.	13.	11.
AVYR	FEB	1	28	.1	-8.5	.470	3.	21.	11.
AVYR	MAR	1	31	.4	-4.0	.500	39.	53.	14.
AVYR	APR	1	30	.4	4.0	.530	90.	121.	16.
AVYR	MAY	1	31	.4	11.0	.610	144.	195.	43.
AVYR	JUNE	1	30	.4	16.4	.670	166.	241.	62.
AVYR	JULY	1	31	.4	19.2	.720	166.	266.	57.
AVYR	AUG	1	31	.4	19.0	.700	125.	241.	20.
AVYR	SEPT	1	30	.4	13.0	.610	63.	134.	7.
AVYR	OCT	1	31	.4	6.0	.550	11.	55.	6.
AVYR	NOV	1	30	.1	-2.0	.500	-18.	27.	0.
AVYR	DEC	1	31	.1	-9.0	.420	-28.	15.	6.

GISS 50N110W NORM AB MONTHLY TOTALS AVERAGED OVER 1 YEARS

MONTH	NET EVAPOTRANSPIRATION		
	RAD.	POTENT.	AREAL
JAN	-17.2	13.5	10.7
FEB	3.3	20.7	10.5
MAR	39.2	53.1	13.9
APR	89.8	121.1	15.6
MAY	143.9	195.4	43.0
JUNE	166.4	240.5	61.8
JULY	166.0	265.9	57.4
AUG	124.9	240.6	20.4
SEPT	63.0	134.1	6.6
OCT	11.5	55.0	5.8
NOV	-17.9	27.4	.1
DEC	-28.1	15.4	5.6

TOTAL OF MONTHLY AVERAGES 744.9 1382.8 251.4

Relative humidity high, sunshine ratio low

GISS 50N110W NORM BA PHID= 50.00 ALTI= 700.0 PPN= 390.00							NET EVAPOTRANSPIRATION		
YEAR	MONTH	STARTDAY	LENGTH	RELH	T	S	RAD.	POTENT.	AREAL
AVYR	JAN	1	31	.9	-12.0	.370	-26.	-2.	-2.
AVYR	FEB	1	28	.9	-8.5	.370	-15.	0.	0.
AVYR	MAR	1	31	.8	-4.0	.420	31.	34.	24.
AVYR	APR	1	30	.8	4.0	.450	78.	69.	50.
AVYR	MAY	1	31	.8	11.0	.500	125.	115.	91.
AVYR	JUNE	1	30	.8	16.4	.600	159.	153.	128.
AVYR	JULY	1	31	.8	19.2	.630	160.	166.	132.
AVYR	AUG	1	31	.8	19.0	.640	127.	145.	101.
AVYR	SEPT	1	30	.8	13.0	.510	59.	84.	39.
AVYR	OCT	1	31	.8	6.0	.480	11.	33.	18.
AVYR	NOV	1	30	.9	-2.0	.410	-23.	-3.	-3.
AVYR	DEC	1	31	.9	-9.0	.320	-28.	-3.	-3.

GISS 50N110W NORM BA MONTHLY TOTALS AVERAGED OVER 1 YEARS

MONTH	NET EVAPOTRANSPIRATION		
	RAD.	POTENT.	AREAL
JAN	-26.2	-2.2	-2.2
FEB	-14.9	-.3	-.3
MAR	31.4	33.5	24.3
APR	78.0	69.2	50.2
MAY	125.1	115.4	90.9
JUNE	159.1	152.9	128.3
JULY	159.6	165.8	132.3
AUG	127.0	144.5	101.3
SEPT	59.1	84.3	38.6
OCT	11.2	32.6	18.5
NOV	-23.3	-2.6	-2.6
DEC	-28.3	-3.1	-3.1

TOTAL OF MONTHLY AVERAGES	657.9	790.0	576.1

Relative humidity high, sunshine ratio high

GISS 50N110W NORM BB PHID= 50.00 ALTI= 700.0 PPN= 390.00

YEAR	MONTH	STARTDAY	LENGTH	RELH	T	S	NET EVAPOTRANSPIRATION		
							RAD.	POTENT.	AREAL
AVYR	JAN	1	31	.9	-12.0	.520	-43.	-5.	-5.
AVYR	FEB	1	28	.9	-8.5	.470	-27.	-3.	-3.
AVYR	MAR	1	31	.8	-4.0	.500	39.	36.	29.
AVYR	APR	1	30	.8	4.0	.530	91.	75.	59.
AVYR	MAY	1	31	.8	11.0	.610	147.	127.	110.
AVYR	JUNE	1	30	.8	16.4	.670	173.	161.	141.
AVYR	JULY	1	31	.8	19.2	.720	175.	176.	147.
AVYR	AUG	1	31	.8	19.0	.700	135.	150.	109.
AVYR	SEPT	1	30	.8	13.0	.610	70.	90.	47.
AVYR	OCT	1	31	.8	6.0	.550	15.	37.	19.
AVYR	NOV	1	30	.9	-2.0	.500	-36.	-7.	-7.
AVYR	DEC	1	31	.9	-9.0	.420	-35.	-5.	-5.

GISS 50N110W NORM BB MONTHLY TOTALS AVERAGED OVER 1 YEARS

MONTH	NET EVAPOTRANSPIRATION		
	RAD.	POTENT.	AREAL
JAN	-42.7	-5.2	-5.2
FEB	-26.7	-3.1	-3.1
MAR	39.4	36.4	28.8
APR	91.3	75.0	59.3
MAY	147.3	127.4	109.5
JUNE	172.5	161.1	140.9
JULY	175.1	175.7	147.2
AUG	135.4	149.8	109.1
SEPT	69.7	90.0	47.2
OCT	15.4	36.7	18.9
NOV	-35.7	-6.7	-6.7
DEC	-35.0	-4.5	-4.5

TOTAL OF MONTHLY AVERAGES	705.9	832.6	641.4

APPENDIX G

Calculation of evapotranspiration for 'normal' sunshine and

'low' and 'high' relative humidity using CRAE model

GISS grid, normal temperature

50N115W, relative humidity low	G-1
relative humidity high	G-2
50N110W, relative humidity low	G-3
relative humidity high	G-4
50N105W, relative humidity low	G-5
relative humidity high	G-6
54N115W, relative humidity low	G-7
relative humidity high	G-8
54N110W, relative humidity low	G-9
relative humidity high	G-10

GISS grid, temperature for 2xCO2

50N115W, relative humidity low	G-11
relative humidity high	G-12
50N110W, relative humidity low	G-13
relative humidity high	G-14
50N105W, relative humidity low	G-15
relative humidity high	G-16
54N115W, relative humidity low	G-17
relative humidity high	G-18
54N110W, relative humidity low	G-19
relative humidity high	G-20

GFDL (GISS grid), temperature for 2xCO2

50N115W, relative humidity low	G-21
relative humidity high	G-22
50N110W, relative humidity low	G-23
relative humidity high	G-24
50N105W, relative humidity low	G-25
relative humidity high	G-26
54N115W, relative humidity low	G-27
relative humidity high	G-28
54N110W, relative humidity low	G-29
relative humidity high	G-30

Normal Temperature
Relative Humidity Low

GISS 50N115W NORM L PHID= 50.00 ALTI= 1500.0 PPN= 727.00							NET EVAPOTRANSPIRATION		
YEAR	MONTH	STARTDAY	LENGTH	RELH	T	S	RAD.	POTENT.	AREAL
AVYR	JAN	1	31	.3	-10.5	.420	-20.	13.	9.
AVYR	FEB	1	28	.3	-7.5	.420	1.	19.	11.
AVYR	MAR	1	31	.4	-5.0	.460	39.	52.	15.
AVYR	APR	1	30	.4	4.0	.500	89.	125.	16.
AVYR	MAY	1	31	.4	11.7	.560	137.	200.	43.
AVYR	JUNE	1	30	.4	10.0	.640	172.	203.	75.
AVYR	JULY	1	31	.4	13.0	.670	171.	227.	71.
AVYR	AUG	1	31	.4	13.0	.670	132.	206.	38.
AVYR	SEPT	1	30	.4	9.0	.550	62.	120.	10.
AVYR	OCT	1	31	.4	3.5	.510	14.	52.	8.
AVYR	NOV	1	30	.3	-5.0	.460	-15.	20.	5.
AVYR	DEC	1	31	.3	-7.5	.360	-28.	15.	4.

GISS 50N115W NORM L MONTHLY TOTALS AVERAGED OVER 1 YEARS

MONTH	NET RAD.	EVAPOTRANSPIRATION POTENT.	AREAL
JAN	-19.6	13.0	9.1
FEB	.6	19.0	11.0
MAR	38.8	52.3	14.8
APR	88.6	125.3	16.1
MAY	137.4	200.3	42.8
JUNE	171.6	202.8	74.8
JULY	170.9	227.2	71.1
AUG	132.2	206.2	37.6
SEPT	62.0	119.7	9.6
OCT	13.6	52.2	8.1
NOV	-15.0	19.9	4.7
DEC	-27.9	14.6	3.9

TOTAL OF MONTHLY AVERAGES	753.2	1252.5	<u>303.5</u>

normal temperature
Relative humidity high

GISS 50N115W NORM H PHID= 50.00 ALTI= 1500.0 PPN= 727.00

YEAR	MONTH	STARTDAY	LENGTH	RELH	T	S	NET EVAPOTRANSPIRATION		
							RAD.	POTENT.	AREAL
AVYR	JAN	1	31	.6	-10.5	.420	-20.	7.	7.
AVYR	FEB	1	28	.6	-7.5	.420	1.	13.	13.
AVYR	MAR	1	31	.5	-5.0	.460	39.	50.	17.
AVYR	APR	1	30	.5	4.0	.500	89.	112.	28.
AVYR	MAY	1	31	.5	11.7	.560	138.	179.	63.
AVYR	JUNE	1	30	.5	10.0	.640	172.	184.	93.
AVYR	JULY	1	31	.5	13.0	.670	171.	205.	92.
AVYR	AUG	1	31	.5	13.0	.670	133.	184.	58.
AVYR	SEPT	1	30	.5	9.0	.550	63.	115.	14.
AVYR	OCT	1	31	.5	3.5	.510	14.	48.	11.
AVYR	NOV	1	30	.6	-5.0	.460	-14.	12.	9.
AVYR	DEC	1	31	.6	-7.5	.360	-27.	7.	7.

GISS 50N115W NORM H MONTHLY TOTALS AVERAGED OVER 1 YEARS

MONTH	NET EVAPOTRANSPIRATION		
	RAD.	POTENT.	AREAL
JAN	-19.7	7.3	7.3
FEB	.6	13.2	13.2
MAR	38.7	49.9	16.7
APR	88.8	112.4	28.0
MAY	138.2	179.2	62.9
JUNE	171.6	184.0	92.9
JULY	171.4	205.1	92.1
AUG	133.0	183.8	58.4
SEPT	62.9	114.6	13.7
OCT	14.2	48.1	10.8
NOV	-14.4	12.0	9.0
DEC	-27.2	7.5	7.5

TOTAL OF MONTHLY AVERAGES 758.1 1116.9 412.3

*Normal temperature
Relative humidity low*

GISS 50N110W NORM L PHID= 50.00 ALTI= 700.0 PPN= 390.00							NET EVAPOTRANSPIRATION		
YEAR	MONTH	STARTDAY	LENGTH	RELH	T	S	RAD.	POTENT.	AREAL
AVYR	JAN	1	31	.3	-12.0	.420	-20.	11.	11.
AVYR	FEB	1	28	.3	-8.5	.420	-1.	17.	11.
AVYR	MAR	1	31	.4	-4.0	.460	35.	50.	13.
AVYR	APR	1	30	.4	4.0	.500	85.	116.	15.
AVYR	MAY	1	31	.4	11.0	.560	133.	190.	34.
AVYR	JUNE	1	30	.4	16.4	.640	160.	237.	56.
AVYR	JULY	1	31	.4	19.2	.670	157.	260.	49.
AVYR	AUG	1	31	.4	19.0	.670	120.	238.	16.
AVYR	SEPT	1	30	.4	13.0	.550	56.	126.	6.
AVYR	OCT	1	31	.4	6.0	.510	9.	52.	6.
AVYR	NOV	1	30	.3	-2.0	.460	-19.	23.	0.
AVYR	DEC	1	31	.3	-9.0	.360	-29.	13.	6.

GISS 50N110W NORM L MONTHLY TOTALS AVERAGED OVER 1 YEARS

MONTH	NET EVAPOTRANSPIRATION		
	RAD.	POTENT.	AREAL
JAN	-20.4	11.1	10.7
FEB	-8	16.7	11.3
MAR	35.1	49.8	13.4
APR	84.6	116.2	14.8
MAY	133.3	190.1	34.5
JUNE	160.2	237.0	56.3
JULY	156.6	260.4	48.8
AUG	120.2	237.9	16.3
SEPT	56.0	125.7	5.9
OCT	8.8	52.4	5.7
NOV	-19.5	22.7	.3
DEC	-28.9	12.5	5.9

TOTAL OF MONTHLY AVERAGES 685.3 1332.5 223.8

Normal Temperature
Relative humidity high

GISS 50N110W NORM H PHID= 50.00 ALTI= 700.0 PPN= 390.00

YEAR	MONTH	STARTDAY	LENGTH	RELH	T	S	NET RAD.	EVAPOTRANSPIRATION POTENT.	AREAL
AVYR	JAN	1	31	.6	-12.0	.420	-25.	5.	5.
AVYR	FEB	1	28	.6	-8.5	.420	-1.	11.	11.
AVYR	MAR	1	31	.5	-4.0	.460	35.	47.	15.
AVYR	APR	1	30	.5	4.0	.500	85.	108.	22.
AVYR	MAY	1	31	.5	11.0	.560	134.	170.	54.
AVYR	JUNE	1	30	.5	16.4	.640	162.	213.	80.
AVYR	JULY	1	31	.5	19.2	.670	159.	233.	76.
AVYR	AUG	1	31	.5	19.0	.670	123.	210.	43.
AVYR	SEPT	1	30	.5	13.0	.550	58.	121.	10.
AVYR	OCT	1	31	.5	6.0	.510	10.	48.	9.
AVYR	NOV	1	30	.6	-2.0	.460	-18.	13.	5.
AVYR	DEC	1	31	.6	-9.0	.360	-28.	6.	6.

GISS 50N110W NORM H MONTHLY TOTALS AVERAGED OVER 1 YEARS

MONTH	NET RAD.	EVAPOTRANSPIRATION POTENT.	AREAL
JAN	-25.5	5.4	5.4
FEB	-7.	11.4	11.4
MAR	35.1	47.4	15.4
APR	85.0	108.1	22.5
MAY	134.2	169.8	54.2
JUNE	161.8	213.1	80.1
JULY	159.1	233.0	76.0
AUG	123.1	210.4	43.1
SEPT	58.0	120.7	10.4
OCT	9.9	48.2	8.5
NOV	-18.2	13.3	5.3
DEC	-28.2	6.4	6.4

TOTAL OF MONTHLY AVERAGES	693.5	1187.0	<u>338.7</u>

Normal temperature
Relative humidity low

1 GISS 50N105W NORM L PHID= 50.00 ALTI= 500.0 PPN= 408.00							NET EVAPOTRANSPIRATION		
YEAR	MONTH	STARTDAY	LENGTH	RELH	T	S	RAD.	POTENT.	AREAL
AVYR	JAN	1	31	.3	-17.0	.420	-19.	7.	7.
AVYR	FEB	1	28	.3	-12.5	.420	2.	13.	13.
AVYR	MAR	1	31	.4	-6.5	.460	36.	44.	15.
AVYR	APR	1	30	.4	4.5	.500	83.	116.	14.
AVYR	MAY	1	31	.4	10.7	.560	132.	187.	32.
AVYR	JUNE	1	30	.4	16.2	.640	159.	234.	54.
AVYR	JULY	1	31	.4	19.0	.670	156.	258.	47.
AVYR	AUG	1	31	.4	19.0	.670	120.	237.	14.
AVYR	SEPT	1	30	.4	12.0	.550	56.	120.	6.
AVYR	OCT	1	31	.4	6.0	.510	8.	51.	5.
AVYR	NOV	1	30	.3	-4.5	.460	-18.	19.	3.
AVYR	DEC	1	31	.3	-11.5	.360	-28.	10.	9.

GISS 50N105W NORM L MONTHLY TOTALS AVERAGED OVER 1 YEARS

MONTH	NET RAD.	EVAPOTRANSPIRATION POTENT.	AREAL
JAN	-18.5	7.4	7.4
FEB	1.9	13.2	13.2
MAR	36.4	43.6	15.2
APR	83.0	115.7	14.0
MAY	132.0	186.6	32.4
JUNE	159.0	234.1	53.6
JULY	156.4	258.0	46.8
AUG	119.8	237.0	14.3
SEPT	55.6	120.0	5.9
OCT	8.0	51.4	5.4
NOV	-18.0	19.3	3.4
DEC	-27.5	10.4	9.1

TOTAL OF MONTHLY AVERAGES	687.9	1296.5	<u>220.6</u>
---------------------------	-------	--------	--------------

Normal Amplitude
Relative humidity high

1 GISS 50N105W NORM H PHID= 50.00 ALTI= 500.0 PPN= 408.00

YEAR	MONTH	STARTDAY	LENGTH	RELH	T	S	NET RAD.	EVAPOTRANSPIRATION POTENT.	AREAL
AVYR	JAN	1	31	.6	-17.0	.420	-32.	3.	3.
AVYR	FEB	1	28	.6	-12.5	.420	-8.	7.	7.
AVYR	MAR	1	31	.5	-6.5	.460	36.	42.	17.
AVYR	APR	1	30	.5	4.5	.500	83.	109.	20.
AVYR	MAY	1	31	.5	10.7	.560	133.	167.	52.
AVYR	JUNE	1	30	.5	16.2	.640	161.	210.	77.
AVYR	JULY	1	31	.5	19.0	.670	159.	231.	74.
AVYR	AUG	1	31	.5	19.0	.670	123.	210.	41.
AVYR	SEPT	1	30	.5	12.0	.550	57.	115.	10.
AVYR	OCT	1	31	.5	6.0	.510	9.	47.	8.
AVYR	NOV	1	30	.6	-4.5	.460	-17.	11.	8.
AVYR	DEC	1	31	.6	-11.5	.360	-30.	5.	5.

GISS 50N105W NORM H MONTHLY TOTALS AVERAGED OVER 1 YEARS

MONTH	NET RAD.	EVAPOTRANSPIRATION POTENT.	AREAL
JAN	-32.2	2.6	2.6
FEB	-7.8	7.2	7.2
MAR	36.3	41.5	16.9
APR	83.4	109.1	20.3
MAY	132.9	166.7	52.0
JUNE	160.6	210.4	77.3
JULY	158.9	230.9	74.0
AUG	122.7	209.6	41.3
SEPT	57.4	115.2	10.3
OCT	9.1	47.1	8.3
NOV	-17.2	11.4	7.8
DEC	-29.8	4.9	4.9

TOTAL OF MONTHLY AVERAGES	674.4	1156.6	<u>322.9</u>

Normal temperature
Relative humidity low

1 GISS 54N115W NORM L PHID= 54.00 ALTI= 800.0 PPN= 478.00

YEAR	MONTH	STARTDAY	LENGTH	RELH	T	S	NET EVAPOTRANSPIRATION		
							RAD.	POTENT.	AREAL
AVYR	JAN	1	31	.3	-17.0	.420	-27.	7.	7.
AVYR	FEB	1	28	.3	-10.0	.420	-9.	13.	10.
AVYR	MAR	1	31	.4	-6.0	.460	27.	39.	14.
AVYR	APR	1	30	.4	3.0	.500	77.	105.	14.
AVYR	MAY	1	31	.4	9.5	.560	130.	179.	34.
AVYR	JUNE	1	30	.4	13.5	.640	160.	217.	58.
AVYR	JULY	1	31	.4	15.6	.670	159.	236.	54.
AVYR	AUG	1	31	.4	14.4	.670	118.	205.	20.
AVYR	SEPT	1	30	.4	9.4	.550	47.	102.	7.
AVYR	OCT	1	31	.4	4.8	.510	-3.	41.	5.
AVYR	NOV	1	30	.3	-5.0	.460	-27.	17.	1.
AVYR	DEC	1	31	.3	-12.7	.360	-34.	9.	9.

GISS 54N115W NORM L MONTHLY TOTALS AVERAGED OVER 1 YEARS

MONTH	NET EVAPOTRANSPIRATION		
	RAD.	POTENT.	AREAL
JAN	-27.3	6.5	6.5
FEB	-8.9	13.5	10.1
MAR	26.9	38.9	13.8
APR	77.2	105.4	14.5
MAY	129.6	178.9	33.5
JUNE	160.2	217.2	58.4
JULY	159.2	236.1	53.8
AUG	118.1	205.4	19.5
SEPT	47.4	101.5	6.7
OCT	-3.2	40.7	4.8
NOV	-27.2	16.7	1.2
DEC	-34.3	8.5	8.5

TOTAL OF MONTHLY AVERAGES 617.6 1169.3 231.4

Normal Temperature

Relative humidity high

1 GISS 54N115W NORM H PHID= 54.00 ALTI= 800.0 PPN= 478.00

YEAR	MONTH	STARTDAY	LENGTH	RELH	T	S	NET EVAPOTRANSPIRATION RAD.	POTENT.	AREAL
AVYR	JAN	1	31	.6	-17.0	.420	-37.	2.	2.
AVYR	FEB	1	28	.6	-10.0	.420	-9.	9.	9.
AVYR	MAR	1	31	.5	-6.0	.460	27.	37.	16.
AVYR	APR	1	30	.5	3.0	.500	77.	101.	19.
AVYR	MAY	1	31	.5	9.5	.560	130.	160.	52.
AVYR	JUNE	1	30	.5	13.5	.640	161.	196.	79.
AVYR	JULY	1	31	.5	15.6	.670	160.	212.	77.
AVYR	AUG	1	31	.5	14.4	.670	119.	182.	42.
AVYR	SEPT	1	30	.5	9.4	.550	49.	97.	11.
AVYR	OCT	1	31	.5	4.8	.510	-2.	36.	8.
AVYR	NOV	1	30	.6	-5.0	.460	-26.	9.	5.
AVYR	DEC	1	31	.6	-12.7	.360	-38.	3.	3.

GISS 54N115W NORM H MONTHLY TOTALS AVERAGED OVER 1 YEARS

MONTH	NET RAD.	EVAPOTRANSPIRATION POTENT.	AREAL
JAN	-37.4	2.1	2.1
FEB	-8.8	8.6	8.6
MAR	26.8	36.7	15.6
APR	77.4	100.9	18.7
MAY	130.2	159.8	52.0
JUNE	161.0	195.6	79.5
JULY	160.5	211.8	77.4
AUG	119.4	181.9	41.8
SEPT	48.6	96.8	10.6
OCT	-2.2	36.0	7.8
NOV	-26.3	8.7	5.1
DEC	-37.6	3.2	3.2

TOTAL OF MONTHLY AVERAGES	611.7	1041.9	<u>322.2</u>

*Normal Temperature
Relative humidity low*

1 GISS 54N110W NORM L PHID= 54.00 ALTI= 400.0 PPN= 435.00							NET EVAPOTRANSPIRATION		
YEAR	MONTH	STARTDAY	LENGTH	RELH	T	S	RAD.	POTENT.	AREAL
AVYR	JAN	1	31	.3	-19.8	.420	-32.	5.	5.
AVYR	FEB	1	28	.3	-14.5	.420	-6.	10.	10.
AVYR	MAR	1	31	.4	-8.5	.460	27.	33.	15.
AVYR	APR	1	30	.4	3.0	.500	75.	101.	14.
AVYR	MAY	1	31	.4	10.5	.560	126.	182.	27.
AVYR	JUNE	1	30	.4	14.2	.640	156.	218.	52.
AVYR	JULY	1	31	.4	16.6	.670	155.	239.	46.
AVYR	AUG	1	31	.4	15.2	.670	115.	208.	13.
AVYR	SEPT	1	30	.4	9.7	.550	45.	99.	6.
AVYR	OCT	1	31	.4	4.0	.510	-4.	38.	5.
AVYR	NOV	1	30	.3	-7.0	.460	-27.	14.	4.
AVYR	DEC	1	31	.3	-15.0	.360	-34.	7.	7.

GISS 54N110W NORM L MONTHLY TOTALS AVERAGED OVER 1 YEARS

MONTH	NET RAD.	EVAPOTRANSPIRATION POTENT.	AREAL
JAN	-32.2	4.6	4.6
FEB	-6.5	9.6	9.6
MAR	27.4	32.9	15.4
APR	74.8	101.0	13.8
MAY	125.7	181.8	27.1
JUNE	156.2	218.1	51.5
JULY	154.6	239.0	45.9
AUG	114.7	207.6	13.2
SEPT	45.2	98.7	5.8
OCT	-4.0	38.3	4.6
NOV	-26.6	14.3	3.8
DEC	-33.6	7.0	7.0

TOTAL OF MONTHLY AVERAGES 595.8 1152.8 202.3

*Normal Temperature
Relative Humidity high*

1 GISS 54N110W NORM H PHID= 54.00 ALTI= 400.0 PPN= 435.00

YEAR	MONTH	STARTDAY	LENGTH	RELH	T	S	NET EVAPOTRANSPIRATION		
							RAD.	POTENT.	AREAL
AVYR	JAN	1	31	.6	-19.8	.420	-38.	1.	1.
AVYR	FEB	1	28	.6	-14.5	.420	-20.	4.	4.
AVYR	MAR	1	31	.5	-8.5	.460	27.	31.	17.
AVYR	APR	1	30	.5	3.0	.500	75.	97.	17.
AVYR	MAY	1	31	.5	10.5	.560	127.	162.	46.
AVYR	JUNE	1	30	.5	14.2	.640	157.	196.	73.
AVYR	JULY	1	31	.5	16.6	.670	156.	214.	71.
AVYR	AUG	1	31	.5	15.2	.670	116.	184.	36.
AVYR	SEPT	1	30	.5	9.7	.550	47.	94.	10.
AVYR	OCT	1	31	.5	4.0	.510	-3.	34.	8.
AVYR	NOV	1	30	.6	-7.0	.460	-25.	8.	7.
AVYR	DEC	1	31	.6	-15.0	.360	-39.	2.	2.

GISS 54N110W NORM H MONTHLY TOTALS AVERAGED OVER 1 YEARS

MONTH	NET EVAPOTRANSPIRATION		
	RAD.	POTENT.	AREAL
JAN	-38.1	1.5	1.5
FEB	-20.0	4.3	4.3
MAR	27.3	31.1	17.0
APR	75.1	97.4	17.2
MAY	126.6	162.0	46.4
JUNE	157.3	196.1	73.4
JULY	156.4	214.1	70.6
AUG	116.5	183.5	36.4
SEPT	46.6	94.1	9.7
OCT	-3.1	33.9	7.6
NOV	-25.0	7.5	7.4
DEC	-39.5	2.3	2.3

TOTAL OF MONTHLY AVERAGES 579.2 1027.7 293.7

Temperature for 2x CO2
Relative humidity Low

1 GISS 50N115W EST L PHID= 50.00 ALTI= 1500.0 PPN= 901.00							NET EVAPOTRANSPIRATION		
YEAR	MONTH	STARTDAY	LENGTH	RELH	T	S	RAD.	POTENT.	AREAL
AVYR	JAN	1	31	.3	-5.3	.420	-24.	18.	3.
AVYR	FEB	1	28	.3	-2.6	.420	-3.	25.	7.
AVYR	MAR	1	31	.4	-1.0	.460	35.	61.	12.
AVYR	APR	1	30	.4	7.4	.500	85.	139.	13.
AVYR	MAY	1	31	.4	14.9	.560	135.	221.	39.
AVYR	JUNE	1	30	.4	13.0	.640	168.	222.	72.
AVYR	JULY	1	31	.4	16.1	.670	168.	248.	68.
AVYR	AUG	1	31	.4	16.6	.670	128.	228.	32.
AVYR	SEPT	1	30	.4	12.9	.550	59.	133.	8.
AVYR	OCT	1	31	.4	7.3	.510	10.	59.	6.
AVYR	NOV	1	30	.3	-1.0	.460	-18.	25.	0.
AVYR	DEC	1	31	.3	-2.8	.360	-31.	20.	0.

GISS 50N115W EST L MONTHLY TOTALS AVERAGED OVER 1 YEARS

MONTH	NET EVAPOTRANSPIRATION		
	RAD.	POTENT.	AREAL
JAN	-23.8	18.2	2.6
FEB	-3.2	24.9	6.9
MAR	35.4	61.2	12.0
APR	85.5	138.6	13.4
MAY	134.9	220.5	38.6
JUNE	168.5	221.5	71.5
JULY	167.8	247.5	67.5
AUG	128.2	228.4	31.8
SEPT	59.1	133.0	7.9
OCT	10.4	58.8	6.2
NOV	-18.2	25.1	.0
DEC	-31.4	19.7	.0

TOTAL OF MONTHLY AVERAGES 713.1 1397.5 258.3

Temperature for 2 x CO2
Relative humidity high

1 GISS 50N115W EST H PHID= 50.00 ALTI= 1500.0 PPN= 901.00

YEAR	MONTH	STARTDAY	LENGTH	RELH	T	S	NET EVAPOTRANSPIRATION		
							RAD.	POTENT.	AREAL
AVYR	JAN	1	31	.6	-5.3	.420	-23.	10.	7.
AVYR	FEB	1	28	.6	-2.6	.420	-2.	17.	12.
AVYR	MAR	1	31	.5	-1.0	.460	36.	58.	14.
AVYR	APR	1	30	.5	7.4	.500	86.	127.	24.
AVYR	MAY	1	31	.5	14.9	.560	136.	197.	61.
AVYR	JUNE	1	30	.5	13.0	.640	169.	200.	92.
AVYR	JULY	1	31	.5	16.1	.670	169.	223.	91.
AVYR	AUG	1	31	.5	16.6	.670	130.	203.	56.
AVYR	SEPT	1	30	.5	12.9	.550	61.	127.	12.
AVYR	OCT	1	31	.5	7.3	.510	11.	54.	9.
AVYR	NOV	1	30	.6	-1.0	.460	-17.	15.	5.
AVYR	DEC	1	31	.6	-2.8	.360	-30.	10.	2.

GISS 50N115W EST H MONTHLY TOTALS AVERAGED OVER 1 YEARS

MONTH	EVAPOTRANSPIRATION		
	NET RAD.	POTENT.	AREAL
JAN	-23.0	9.9	6.6
FEB	-2.4	16.7	11.7
MAR	35.5	58.1	14.3
APR	86.1	127.1	24.0
MAY	136.4	196.6	61.4
JUNE	169.0	200.2	91.9
JULY	169.0	222.7	91.2
AUG	129.8	202.7	55.7
SEPT	60.7	127.5	12.4
OCT	11.5	54.0	9.0
NOV	-17.0	14.7	5.0
DEC	-29.9	9.8	1.7

TOTAL OF MONTHLY AVERAGES 725.6 1240.1 384.9

Temperature for 2xCO2
Relative humidity low

1 GISS 50M110W EST L PHID= 50.00 ALTI= 700.0 PPN= 453.00

YEAR	MONTH	STARTDAY	LENGTH	RELH	T	S	NET RAD.	EVAPOTRANSPIRATION POTENT.	AREAL
AVYR	JAN	1	31	.3	-6.1	.420	-25.	16.	3.
AVYR	FEB	1	28	.3	-3.1	.420	-5.	23.	6.
AVYR	MAR	1	31	.4	.6	.460	36.	62.	11.
AVYR	APR	1	30	.4	8.0	.500	81.	132.	11.
AVYR	MAY	1	31	.4	14.6	.560	131.	213.	29.
AVYR	JUNE	1	30	.4	19.7	.640	154.	257.	49.
AVYR	JULY	1	31	.4	22.5	.670	153.	282.	44.
AVYR	AUG	1	31	.4	23.0	.670	117.	264.	10.
AVYR	SEPT	1	30	.4	17.8	.550	53.	143.	4.
AVYR	OCT	1	31	.4	11.3	.510	5.	63.	3.
AVYR	NOV	1	30	.3	3.5	.460	-27.	33.	0.
AVYR	DEC	1	31	.3	-3.2	.360	-33.	18.	0.

GISS 50M110W EST L MONTHLY TOTALS AVERAGED OVER 1 YEARS

MONTH	NET RAD.	EVAPOTRANSPIRATION POTENT.	AREAL
JAN	-25.2	16.5	3.3
FEB	-5.0	23.0	6.2
MAR	35.9	61.6	11.1
APR	81.2	131.6	11.5
MAY	130.6	213.1	29.1
JUNE	153.8	256.9	49.1
JULY	152.6	282.4	43.6
AUG	116.7	264.1	9.8
SEPT	52.9	142.5	4.4
OCT	5.2	62.5	3.1
NOV	-27.3	33.5	.0
DEC	-33.2	18.4	.0
<hr/>			
TOTAL OF MONTHLY AVERAGES	638.2	1506.2	171.1

Temperature for 2x CO2
Relative humidity high

1 GISS 50N110W EST H PHID= 50.00 ALTI= 700.0 PPN= 453.00

YEAR	MONTH	STARTDAY	LENGTH	RELH	T	S	NET RAD.	EVAPOTRANSPIRATION POTENT.	AREAL
AVYR	JAN	1	31	.6	-6.1	.420	-24.	9.	7.
AVYR	FEB	1	28	.6	-3.1	.420	-4.	15.	11.
AVYR	MAR	1	31	.5	.6	.460	36.	58.	14.
AVYR	APR	1	30	.5	8.0	.500	82.	126.	17.
AVYR	MAY	1	31	.5	14.6	.560	132.	190.	52.
AVYR	JUNE	1	30	.5	19.7	.640	157.	230.	76.
AVYR	JULY	1	31	.5	22.5	.670	156.	252.	74.
AVYR	AUG	1	31	.5	23.0	.670	121.	233.	41.
AVYR	SEPT	1	30	.5	17.8	.550	56.	138.	9.
AVYR	OCT	1	31	.5	11.3	.510	7.	58.	6.
AVYR	NOV	1	30	.6	3.5	.460	-24.	20.	1.
AVYR	DEC	1	31	.6	-3.2	.360	-32.	9.	2.

GISS 50N110W EST H MONTHLY TOTALS AVERAGED OVER 1 YEARS

MONTH	NET RAD.	EVAPOTRANSPIRATION POTENT.	AREAL
JAN	-24.4	8.9	7.3
FEB	-4.1	15.3	11.0
MAR	36.3	58.3	13.8
APR	82.1	125.6	17.2
MAY	132.4	189.8	52.1
JUNE	156.5	230.1	76.0
JULY	156.5	252.1	74.3
AUG	121.2	232.9	40.9
SEPT	56.3	137.5	9.4
OCT	7.3	57.7	6.2
NOV	-24.1	19.9	1.0
DEC	-31.6	9.1	2.0

TOTAL OF MONTHLY AVERAGES	664.4	1337.2	311.2

Temperature for 2xCO2

Relative humidity low

1 GISS 50N105W EST L PHID= 50.00 ALTI= 500.0 PPN= 463.00						NET EVAPOTRANSPIRATION			
YEAR	MONTH	STARTDAY	LENGTH	RELH	T	S	RAD.	POTENT.	AREAL
AVYR	JAN	1	31	.3	-11.0	.420	-22.	12.	10.
AVYR	FEB	1	28	.3	-6.9	.420	-3.	18.	10.
AVYR	MAR	1	31	.4	-1.7	.460	32.	53.	12.
AVYR	APR	1	30	.4	8.6	.500	80.	131.	11.
AVYR	MAY	1	31	.4	14.4	.560	129.	210.	27.
AVYR	JUNE	1	30	.4	19.5	.640	154.	255.	47.
AVYR	JULY	1	31	.4	22.3	.670	153.	281.	42.
AVYR	AUG	1	31	.4	23.0	.670	117.	263.	9.
AVYR	SEPT	1	30	.4	17.0	.550	53.	138.	4.
AVYR	OCT	1	31	.4	11.6	.510	4.	62.	3.
AVYR	NOV	1	30	.3	1.4	.460	-26.	30.	0.
AVYR	DEC	1	31	.3	-5.5	.360	-32.	16.	1.

GISS 50N105W EST L MONTHLY TOTALS AVERAGED OVER 1 YEARS

MONTH	EVAPOTRANSPIRATION		
	NET RAD.	POTENT.	AREAL
JAN	-21.8	11.7	9.6
FEB	-2.7	18.1	9.6
MAR	32.2	53.4	11.5
APR	79.5	131.5	10.6
MAY	129.3	210.2	26.8
JUNE	153.8	254.7	47.3
JULY	153.0	280.6	42.0
AUG	117.1	263.4	8.8
SEPT	53.0	138.2	4.0
OCT	4.4	62.1	2.6
NOV	-26.1	29.8	.0
DEC	-32.1	15.7	1.0

TOTAL OF MONTHLY AVERAGES 639.6 1469.3 173.8

Temperature for 2xCO2

Relative humidity high

1 GISS 50N105W EST H PHID= 50.00 ALTI= 500.0 PPN= 463.00							NET EVAPOTRANSPIRATION		
YEAR	MONTH	STARTDAY	LENGTH	RELH	T	S	RAD.	POTENT.	AREAL
AVYR	JAN	1	31	.6	-11.0	.420	-24.	6.	6.
AVYR	FEB	1	28	.6	-6.9	.420	-2.	12.	12.
AVYR	MAR	1	31	.5	-1.7	.460	32.	51.	14.
AVYR	APR	1	30	.5	8.6	.500	81.	127.	15.
AVYR	MAY	1	31	.5	14.4	.560	131.	187.	50.
AVYR	JUNE	1	30	.5	19.5	.640	157.	228.	74.
AVYR	JULY	1	31	.5	22.3	.670	157.	251.	73.
AVYR	AUG	1	31	.5	23.0	.670	122.	233.	40.
AVYR	SEPT	1	30	.5	17.0	.550	56.	133.	9.
AVYR	OCT	1	31	.5	11.6	.510	7.	57.	6.
AVYR	NOV	1	30	.6	1.4	.460	-24.	18.	3.
AVYR	DEC	1	31	.6	-5.5	.360	-31.	8.	5.

GISS 50N105W EST H MONTHLY TOTALS AVERAGED OVER 1 YEARS

MONTH	NET RAD.	EVAPOTRANSPIRATION POTENT.	AREAL
JAN	-23.6	6.2	6.2
FEB	-2.4	12.2	12.2
MAR	32.4	50.6	13.8
APR	80.6	127.1	15.0
MAY	131.1	187.1	49.6
JUNE	156.5	228.2	74.2
JULY	157.0	250.6	72.8
AUG	121.8	232.9	39.7
SEPT	56.2	133.3	8.9
OCT	6.6	57.4	5.8
NOV	-23.6	17.8	3.2
DEC	-30.9	7.8	4.9

TOTAL OF MONTHLY AVERAGES	661.9	1311.1	<u>306.3</u>

Temperature for 2 x CO2
Relative humidity low

1 GISS 54N115W EST L PHID= 54.00 ALTI= 800.0 PPN= 568.00							NET EVAPOTRANSPIRATION		
YEAR	MONTH	STARTDAY	LENGTH	RELH	T	S	RAD.	POTENT.	AREAL
AVYR	JAN	1	31	.3	-11.4	.420	-31.	10.	8.
AVYR	FEB	1	28	.3	-5.1	.420	-13.	18.	5.
AVYR	MAR	1	31	.4	-2.1	.460	24.	46.	11.
AVYR	APR	1	30	.4	6.4	.500	74.	117.	12.
AVYR	MAY	1	31	.4	12.6	.560	127.	198.	29.
AVYR	JUNE	1	30	.4	16.5	.640	157.	236.	54.
AVYR	JULY	1	31	.4	18.6	.670	153.	254.	47.
AVYR	AUG	1	31	.4	17.9	.670	113.	227.	12.
AVYR	SEPT	1	30	.4	13.3	.550	45.	114.	5.
AVYR	OCT	1	31	.4	8.9	.510	-6.	49.	1.
AVYR	NOV	1	30	.3	-4	.460	-31.	22.	0.
AVYR	DEC	1	31	.3	-7.4	.360	-38.	13.	2.

GISS 54N115W EST L MONTHLY TOTALS AVERAGED OVER 1 YEARS

MONTH	NET RAD.	EVAPOTRANSPIRATION POTENT.	AREAL
JAN	-30.6	10.1	8.3
FEB	-12.6	18.4	5.0
MAR	23.5	45.7	11.0
APR	74.1	117.4	11.7
MAY	127.0	198.0	28.6
JUNE	157.2	236.5	54.4
JULY	153.3	254.5	47.0
AUG	113.5	226.7	12.2
SEPT	44.8	113.8	4.9
OCT	-6.2	48.7	.8
NOV	-30.8	22.1	.0
DEC	-38.3	12.5	1.9

TOTAL OF MONTHLY AVERAGES	574.9	1304.3	<u>185.9</u>

Temperature for 2x CO2
Relative humidity high

1 GISS 54N115W EST H PHID= 54.00 ALTI= 800.0 PPN= 568.00							NET EVAPOTRANSPIRATION		
YEAR	MONTH	STARTDAY	LENGTH	RELH	T	S	RAD.	POTENT.	AREAL
AVYR	JAN	1	31	.6	-11.4	.420	-33.	4.	4.
AVYR	FEB	1	28	.6	-5.1	.420	-12.	11.	9.
AVYR	MAR	1	31	.5	-2.1	.460	24.	43.	13.
AVYR	APR	1	30	.5	6.4	.500	75.	113.	16.
AVYR	MAY	1	31	.5	12.6	.560	128.	176.	50.
AVYR	JUNE	1	30	.5	16.5	.640	159.	212.	78.
AVYR	JULY	1	31	.5	18.6	.670	156.	227.	73.
AVYR	AUG	1	31	.5	17.9	.670	116.	200.	38.
AVYR	SEPT	1	30	.5	13.3	.550	47.	109.	9.
AVYR	OCT	1	31	.5	8.9	.510	-5.	43.	4.
AVYR	NOV	1	30	.6	-4	.460	-29.	11.	0.
AVYR	DEC	1	31	.6	-7.4	.360	-37.	5.	5.

GISS 54N115W EST H MONTHLY TOTALS AVERAGED OVER 1 YEARS

MONTH	NET EVAPOTRANSPIRATION		
	RAD.	POTENT.	AREAL
JAN	-32.7	4.4	4.4
FEB	-12.0	11.3	9.1
MAR	23.7	42.9	13.1
APR	74.8	113.2	15.6
MAY	128.2	176.3	49.6
JUNE	158.7	212.4	78.1
JULY	155.5	227.5	73.4
AUG	115.9	200.0	37.7
SEPT	46.8	108.7	9.2
OCT	-4.6	42.9	4.4
NOV	-29.0	11.3	.0
DEC	-37.3	5.3	5.3

TOTAL OF MONTHLY AVERAGES 588.0 1156.1 299.9

*Temperature for 2xCO2
Relative humidity low*

1 GISS 54N110W EST L PHID= 54.00 ALTI= 400.0 PPN= 516.00							NET EVAPOTRANSPIRATION		
YEAR	MONTH	STARTDAY	LENGTH	RELH	T	S	RAD.	POTENT.	AREAL
AVYR	JAN	1	31	.3	-13.6	.420	-30.	8.	8.
AVYR	FEB	1	28	.3	-9.0	.420	-11.	14.	9.
AVYR	MAR	1	31	.4	-4.0	.460	23.	40.	12.
AVYR	APR	1	30	.4	6.8	.500	71.	114.	11.
AVYR	MAY	1	31	.4	14.0	.560	123.	204.	21.
AVYR	JUNE	1	30	.4	17.5	.640	153.	239.	47.
AVYR	JULY	1	31	.4	19.9	.670	150.	261.	40.
AVYR	AUG	1	31	.4	19.0	.670	111.	228.	9.
AVYR	SEPT	1	30	.4	14.3	.550	43.	113.	4.
AVYR	OCT	1	31	.4	9.2	.510	-8.	48.	0.
AVYR	NOV	1	30	.3	-1.2	.460	-31.	21.	0.
AVYR	DEC	1	31	.3	-8.8	.360	-38.	11.	4.

GISS 54N110W EST L MONTHLY TOTALS AVERAGED OVER 1 YEARS

MONTH	NET RAD.	EVAPOTRANSPIRATION POTENT.	AREAL
JAN	-29.8	8.4	8.4
FEB	-10.9	13.9	8.9
MAR	23.5	40.2	12.1
APR	71.5	114.2	10.6
MAY	123.1	203.8	21.4
JUNE	152.8	239.4	46.6
JULY	150.0	260.6	39.6
AUG	110.5	228.0	8.7
SEPT	42.6	113.4	3.6
OCT	-7.8	48.4	.0
NOV	-31.3	20.6	.0
DEC	-38.3	11.1	4.1

TOTAL OF MONTHLY AVERAGES 555.9 1302.1 163.8

Temperature for 2 x CO2
Relative humidity high

1 GISS 54N110W EST H PHID= 54.00 ALTI= 400.0 PPN= 516.00

YEAR	MONTH	STARTDAY	LENGTH	RELH	T	S	NET EVAPOTRANSPIRATION		
							RAD.	POTENT.	AREAL
AVYR	JAN	1	31	.6	-13.6	.420	-36.	3.	3.
AVYR	FEB	1	28	.6	-9.0	.420	-11.	9.	9.
AVYR	MAR	1	31	.5	-4.0	.460	24.	38.	14.
AVYR	APR	1	30	.5	6.8	.500	72.	110.	15.
AVYR	MAY	1	31	.5	14.0	.560	125.	181.	44.
AVYR	JUNE	1	30	.5	17.5	.640	155.	215.	72.
AVYR	JULY	1	31	.5	19.9	.670	153.	233.	68.
AVYR	AUG	1	31	.5	19.0	.670	114.	204.	32.
AVYR	SEPT	1	30	.5	14.3	.550	45.	109.	8.
AVYR	OCT	1	31	.5	9.2	.510	-6.	43.	3.
AVYR	NOV	1	30	.6	-1.2	.460	-30.	11.	0.
AVYR	DEC	1	31	.6	-8.8	.360	-37.	5.	5.

GISS 54N110W EST H MONTHLY TOTALS AVERAGED OVER 1 YEARS

MONTH	NET EVAPOTRANSPIRATION		
	RAD.	POTENT.	AREAL
JAN	-36.3	3.1	3.1
FEB	-10.6	8.7	8.7
MAR	23.6	37.7	14.0
APR	72.3	110.1	14.5
MAY	124.8	181.1	43.8
JUNE	154.8	214.6	71.5
JULY	152.9	232.6	67.7
AUG	113.5	204.0	32.4
SEPT	45.0	108.5	7.9
OCT	-5.9	42.6	3.0
NOV	-29.5	10.5	.3
DEC	-37.4	4.7	4.7

TOTAL OF MONTHLY AVERAGES 567.2 1158.3 271.7

*Temperature for 2 x CO2
Relative humidity low*

1 GFDL 50N115W EST L PHID= 50.00 ALTI= 1500.0 PPN= 493.00							NET EVAPOTRANSPIRATION		
YEAR	MONTH	STARTDAY	LENGTH	RELH	T	S	RAD.	POTENT.	AREAL
AVYR	JAN	1	31	.3	-11.8	.420	-18.	12.	11.
AVYR	FEB	1	28	.3	-7.3	.420	0.	19.	11.
AVYR	MAR	1	31	.4	-6	.460	35.	62.	12.
AVYR	APR	1	30	.4	10.9	.500	83.	153.	11.
AVYR	MAY	1	31	.4	14.1	.560	135.	215.	40.
AVYR	JUNE	1	30	.4	15.9	.640	166.	240.	69.
AVYR	JULY	1	31	.4	18.9	.670	160.	263.	59.
AVYR	AUG	1	31	.4	19.2	.670	121.	242.	24.
AVYR	SEPT	1	30	.4	13.2	.550	59.	134.	8.
AVYR	OCT	1	31	.4	8.4	.510	10.	61.	6.
AVYR	NOV	1	30	.3	-4	.460	-19.	26.	0.
AVYR	DEC	1	31	.3	-6.8	.360	-28.	15.	3.

GFDL 50N115W EST L MONTHLY TOTALS AVERAGED OVER 1 YEARS

MONTH	NET RAD.	EVAPOTRANSPIRATION POTENT.	AREAL
JAN	-18.5	11.9	10.5
FEB	.4	19.2	10.9
MAR	35.0	62.1	11.7
APR	82.7	152.8	11.2
MAY	135.4	215.4	39.6
JUNE	165.9	240.2	68.6
JULY	159.5	262.8	59.2
AUG	121.3	242.2	24.0
SEPT	58.9	134.1	7.8
OCT	9.5	60.8	5.7
NOV	-18.7	25.9	.0
DEC	-28.4	15.3	3.0

TOTAL OF MONTHLY AVERAGES 703.2 1442.7 252.3

Temperature for 2 x CO2
Relative humidity high

1 GFDL 50N115W EST H PHID= 50.00 ALTI= 1500.0 PPN= 493.00

YEAR	MONTH	STARTDAY	LENGTH	RELH	T	S	NET EVAPOTRANSPIRATION		
							RAD.	POTENT.	AREAL
AVYR	JAN	1	31	.6	-11.8	.420	-23.	6.	6.
AVYR	FEB	1	28	.6	-7.3	.420	1.	13.	13.
AVYR	MAR	1	31	.5	-6	.460	35.	59.	14.
AVYR	APR	1	30	.5	10.9	.500	84.	143.	20.
AVYR	MAY	1	31	.5	14.1	.560	137.	192.	62.
AVYR	JUNE	1	30	.5	15.9	.640	167.	216.	91.
AVYR	JULY	1	31	.5	18.9	.670	161.	235.	85.
AVYR	AUG	1	31	.5	19.2	.670	124.	214.	50.
AVYR	SEPT	1	30	.5	13.2	.550	61.	129.	12.
AVYR	OCT	1	31	.5	8.4	.510	11.	56.	9.
AVYR	NOV	1	30	.6	-4	.460	-17.	15.	4.
AVYR	DEC	1	31	.6	-6.8	.360	-28.	8.	7.

GFDL 50N115W EST H MONTHLY TOTALS AVERAGED OVER 1 YEARS

MONTH	NET EVAPOTRANSPIRATION		
	RAD.	POTENT.	AREAL
JAN	-23.2	5.9	5.9
FEB	.5	13.3	13.3
MAR	35.2	58.9	14.1
APR	83.9	143.1	20.1
MAY	136.8	192.2	61.7
JUNE	167.1	216.4	91.4
JULY	161.4	235.4	85.3
AUG	123.7	214.1	50.1
SEPT	60.6	128.5	12.3
OCT	10.8	55.9	8.6
NOV	-17.3	15.2	4.4
DEC	-27.6	7.8	6.6

TOTAL OF MONTHLY AVERAGES	711.8	1286.6	<u>374.0</u>

*Temperature for 2 x CO2
Relative Humidity low*

1 GFDL 50N110W EST L PHID= 50.00 ALTI= 700.0 PPN= 515.00							NET EVAPOTRANSPIRATION		
YEAR	MONTH	STARTDAY	LENGTH	RELH	T	S	RAD.	POTENT.	AREAL
AVYR	JAN	1	31	.3	-13.2	.420	-19.	10.	10.
AVYR	FEB	1	28	.3	-8.8	.420	-1.	16.	12.
AVYR	MAR	1	31	.4	-1.9	.460	33.	54.	12.
AVYR	APR	1	30	.4	10.5	.500	79.	142.	10.
AVYR	MAY	1	31	.4	14.2	.560	131.	210.	30.
AVYR	JUNE	1	30	.4	16.0	.640	161.	235.	57.
AVYR	JULY	1	31	.4	18.7	.670	158.	257.	50.
AVYR	AUG	1	31	.4	18.9	.670	120.	237.	17.
AVYR	SEPT	1	30	.4	13.0	.550	56.	126.	6.
AVYR	OCT	1	31	.4	8.3	.510	7.	57.	4.
AVYR	NOV	1	30	.3	-1.0	.460	-20.	24.	0.
AVYR	DEC	1	31	.3	-8.2	.360	-29.	13.	5.

GFDL 50N110W EST L MONTHLY TOTALS AVERAGED OVER 1 YEARS

MONTH	NET RAD.	EVAPOTRANSPIRATION POTENT.	AREAL
JAN	-19.4	10.2	10.2
FEB	-1.5	16.4	11.6
MAR	33.3	54.3	11.8
APR	79.3	141.7	9.7
MAY	130.9	210.5	29.7
JUNE	160.9	234.6	57.1
JULY	157.6	257.3	50.0
AUG	120.4	237.3	16.6
SEPT	56.0	125.7	5.9
OCT	7.1	56.6	4.4
NOV	-20.3	24.0	.0
DEC	-29.5	13.2	4.8

TOTAL OF MONTHLY AVERAGES	675.9	1381.7	211.7

Temperature for 2x CO2
Relative humidity high

1 GISS 50N110W EST H PHID= 50.00 ALTI= 700.0 PPN= 515.00							NET EVAPOTRANSPIRATION		
YEAR	MONTH	STARTDAY	LENGTH	RELH	T	S	RAD.	POTENT.	AREAL
AVYR	JAN	1	31	.6	-13.2	.420	-28.	4.	4.
AVYR	FEB	1	28	.6	-8.8	.420	-1.	11.	11.
AVYR	MAR	1	31	.5	-1.9	.460	33.	51.	14.
AVYR	APR	1	30	.5	10.5	.500	81.	137.	14.
AVYR	MAY	1	31	.5	14.2	.560	133.	188.	52.
AVYR	JUNE	1	30	.5	16.0	.640	162.	211.	81.
AVYR	JULY	1	31	.5	18.7	.670	160.	230.	77.
AVYR	AUG	1	31	.5	18.9	.670	123.	210.	43.
AVYR	SEPT	1	30	.5	13.0	.550	58.	121.	10.
AVYR	OCT	1	31	.5	8.3	.510	9.	52.	7.
AVYR	NOV	1	30	.6	-1.0	.460	-19.	14.	4.
AVYR	DEC	1	31	.6	-8.2	.360	-29.	7.	7.

GISS 50N110W EST H MONTHLY TOTALS AVERAGED OVER 1 YEARS

MONTH	NET RAD.	EVAPOTRANSPIRATION POTENT.	AREAL
JAN	-27.8	4.5	4.5
FEB	-5	11.2	11.2
MAR	33.4	51.5	14.1
APR	80.7	136.9	14.4
MAY	132.6	187.5	52.3
JUNE	162.4	211.0	80.5
JULY	160.0	230.4	76.7
AUG	123.2	209.9	43.3
SEPT	58.0	120.7	10.4
OCT	8.6	52.0	7.4
NOV	-18.8	14.0	4.3
DEC	-28.7	6.7	6.7

TOTAL OF MONTHLY AVERAGES 683.0 1236.3 325.6

Temperature for 2x CO2
Relative humidity low

1 GFDL 50N105W EST L PHID= 50.00 ALTI= 500.0 PPN= 608.00							NET EVAPOTRANSPIRATION		
YEAR	MONTH	STARTDAY	LENGTH	RELH	T	S	RAD.	POTENT.	AREAL
AVYR	JAN	1	31	.3	-15.7	.420	-18.	8.	8.
AVYR	FEB	1	28	.3	-11.4	.420	1.	14.	13.
AVYR	MAR	1	31	.4	-3.4	.460	34.	50.	13.
AVYR	APR	1	30	.4	9.1	.500	79.	133.	10.
AVYR	MAY	1	31	.4	14.9	.560	129.	213.	26.
AVYR	JUNE	1	30	.4	17.5	.640	157.	242.	51.
AVYR	JULY	1	31	.4	19.2	.670	156.	259.	46.
AVYR	AUG	1	31	.4	18.7	.670	120.	235.	15.
AVYR	SEPT	1	30	.4	13.2	.550	55.	124.	5.
AVYR	OCT	1	31	.4	8.3	.510	6.	55.	4.
AVYR	NOV	1	30	.3	-1.6	.460	-20.	23.	0.
AVYR	DEC	1	31	.3	-10.5	.360	-28.	11.	8.

GFDL 50N105W EST L MONTHLY TOTALS AVERAGED OVER 1 YEARS

MONTH	NET RAD.	EVAPOTRANSPIRATION POTENT.	AREAL
JAN	-17.8	8.3	8.3
FEB	1.0	13.9	13.4
MAR	33.7	49.8	12.8
APR	79.2	133.4	10.2
MAY	129.0	213.5	26.1
JUNE	156.9	242.2	51.1
JULY	156.0	259.3	46.4
AUG	120.2	235.2	14.9
SEPT	55.0	124.3	5.3
OCT	6.3	55.5	4.1
NOV	-20.4	22.9	.0
DEC	-28.3	11.1	7.8

TOTAL OF MONTHLY AVERAGES	670.7	1369.5	<u>200.5</u>

Temperature for 2 x CO2
Relative humidity high

1 GFDL 50N105W EST H PHID= 50.00 ALTI= 500.0 PPN= 608.00							NET EVAPOTRANSPIRATION		
YEAR	MONTH	STARTDAY	LENGTH	RELH	T	S	RAD.	POTENT.	AREAL
AVYR	JAN	1	31	.6	-15.7	.420	-31.	3.	3.
AVYR	FEB	1	28	.6	-11.4	.420	-4.	9.	9.
AVYR	MAR	1	31	.5	-3.4	.460	34.	47.	15.
AVYR	APR	1	30	.5	9.1	.500	80.	129.	15.
AVYR	MAY	1	31	.5	14.9	.560	131.	190.	49.
AVYR	JUNE	1	30	.5	17.5	.640	159.	217.	76.
AVYR	JULY	1	31	.5	19.2	.670	159.	232.	74.
AVYR	AUG	1	31	.5	18.7	.670	123.	208.	42.
AVYR	SEPT	1	30	.5	13.2	.550	57.	119.	10.
AVYR	OCT	1	31	.5	8.3	.510	8.	51.	7.
AVYR	NOV	1	30	.6	-1.6	.460	-19.	13.	5.
AVYR	DEC	1	31	.6	-10.5	.360	-28.	6.	6.

6FDL 50N105W EST H MONTHLY TOTALS AVERAGED OVER 1 YEARS

MONTH	NET RAD.	EVAPOTRANSPIRATION POTENT.	AREAL
JAN	-31.3	3.1	3.1
FEB	-4.1	8.5	8.5
MAR	33.7	47.3	14.9
APR	80.3	129.0	14.7
MAY	131.0	190.0	49.4
JUNE	158.9	217.4	76.0
JULY	158.7	232.1	73.8
AUG	123.0	208.0	41.6
SEPT	57.0	119.4	9.8
OCT	7.9	51.0	7.1
NOV	-18.9	13.4	4.7
DEC	-28.0	5.6	5.6

TOTAL OF MONTHLY AVERAGES	668.2	1224.8	<u>309.3</u>

Temperature for 2xCO2
Relative humidity low

1 GFDL 54N115W EST L PHID= 54.00 ALTI= 800.0 PPN= 683.00							NET EVAPOTRANSPIRATION		
YEAR	MONTH	STARTDAY	LENGTH	RELH	T	S	RAD.	POTENT.	AREAL
AVYR	JAN	1	31	.3	-16.8	.420	-27.	7.	7.
AVYR	FEB	1	28	.3	-10.8	.420	-8.	13.	11.
AVYR	MAR	1	31	.4	-2.9	.460	24.	44.	12.
AVYR	APR	1	30	.4	9.3	.500	72.	128.	10.
AVYR	MAY	1	31	.4	13.8	.560	126.	206.	27.
AVYR	JUNE	1	30	.4	13.9	.640	160.	220.	58.
AVYR	JULY	1	31	.4	16.5	.670	158.	242.	52.
AVYR	AUG	1	31	.4	17.2	.670	115.	223.	14.
AVYR	SEPT	1	30	.4	12.4	.550	45.	111.	5.
AVYR	OCT	1	31	.4	6.9	.510	-5.	45.	3.
AVYR	NOV	1	30	.3	-4.5	.460	-28.	17.	0.
AVYR	DEC	1	31	.3	-12.6	.360	-34.	9.	9.

GFDL 54N115W EST L MONTHLY TOTALS AVERAGED OVER 1 YEARS

MONTH	NET RAD.	EVAPOTRANSPIRATION POTENT.	AREAL
JAN	-26.9	6.7	6.7
FEB	-8.3	12.8	10.8
MAR	24.2	44.2	11.6
APR	71.8	128.1	9.6
MAY	126.1	205.6	26.8
JUNE	159.9	219.8	57.9
JULY	157.9	241.8	52.2
AUG	114.7	222.6	14.0
SEPT	45.3	110.9	5.3
OCT	-4.8	44.7	2.7
NOV	-27.6	17.2	.5
DEC	-34.4	8.6	8.6

TOTAL OF MONTHLY AVERAGES	597.9	1263.0	<u>206.5</u>

Temperature for 2x CO2
Relative humidity high

1 GFDL 54N115W EST H PHID= 54.00 ALTI= 800.0 PPN= 683.00

YEAR	MONTH	STARTDAY	LENGTH	RELH	T	S	NET RAD.	EVAPOTRANSPIRATION POTENT.	AREAL
AVYR	JAN	1	31	.6	-16.8	.420	-37.	2.	2.
AVYR	FEB	1	28	.6	-10.8	.420	-10.	8.	8.
AVYR	MAR	1	31	.5	-2.9	.460	24.	42.	14.
AVYR	APR	1	30	.5	9.3	.500	73.	123.	14.
AVYR	MAY	1	31	.5	13.8	.560	128.	183.	49.
AVYR	JUNE	1	30	.5	13.9	.640	161.	198.	79.
AVYR	JULY	1	31	.5	16.5	.670	159.	217.	77.
AVYR	AUG	1	31	.5	17.2	.670	117.	197.	39.
AVYR	SEPT	1	30	.5	12.4	.550	47.	106.	9.
AVYR	OCT	1	31	.5	6.9	.510	-4.	39.	6.
AVYR	NOV	1	30	.6	-4.5	.460	-27.	9.	5.
AVYR	DEC	1	31	.6	-12.6	.360	-38.	3.	3.

6FDL 54N115W EST H MONTHLY TOTALS AVERAGED OVER 1 YEARS

MONTH	NET RAD.	EVAPOTRANSPIRATION POTENT.	AREAL
JAN	-37.3	2.1	2.1
FEB	-9.9	7.8	7.8
MAR	24.3	41.6	13.6
APR	72.9	123.4	13.9
MAY	127.6	182.9	48.9
JUNE	160.7	197.9	79.3
JULY	159.4	216.8	76.6
AUG	116.9	196.5	38.8
SEPT	47.1	105.8	9.4
OCT	-3.5	39.4	6.0
NOV	-26.7	9.0	4.5
DEC	-37.5	3.2	3.2

TOTAL OF MONTHLY AVERAGES 594.0 1126.4 304.2

Temperature for 2 x CO2
Relative humidity low

1 GFDL 54N110W EST L PHID= 54.00 ALTI= 400.0 PPN= 670.00

YEAR	MONTH	STARTDAY	LENGTH	RELH	T	S	NET EVAPOTRANSPIRATION		
							RAD.	POTENT.	AREAL
AVYR	JAN	1	31	.3	-17.7	.420	-30.	6.	6.
AVYR	FEB	1	28	.3	-11.7	.420	-9.	12.	12.
AVYR	MAR	1	31	.4	-3.4	.460	23.	41.	12.
AVYR	APR	1	30	.4	9.0	.500	70.	122.	9.
AVYR	MAY	1	31	.4	13.2	.560	124.	199.	23.
AVYR	JUNE	1	30	.4	14.1	.640	156.	217.	52.
AVYR	JULY	1	31	.4	16.8	.670	154.	240.	45.
AVYR	AUG	1	31	.4	17.2	.670	113.	220.	10.
AVYR	SEPT	1	30	.4	12.4	.550	44.	107.	4.
AVYR	OCT	1	31	.4	7.1	.510	-6.	44.	1.
AVYR	NOV	1	30	.3	-4.7	.460	-29.	17.	1.
AVYR	DEC	1	31	.3	-13.2	.360	-35.	8.	8.

GFDL 54N110W EST L MONTHLY TOTALS AVERAGED OVER 1 YEARS

MONTH	NET EVAPOTRANSPIRATION		
	RAD.	POTENT.	AREAL
JAN	-29.6	5.8	5.8
FEB	-8.7	11.7	11.5
MAR	23.0	41.2	11.6
APR	69.8	122.2	8.9
MAY	123.6	198.7	22.6
JUNE	156.3	217.4	51.7
JULY	154.3	240.3	45.5
AUG	112.6	219.8	9.6
SEPT	43.5	107.1	4.3
OCT	-6.4	44.1	1.3
NOV	-28.5	16.6	.6
DEC	-35.0	8.0	8.0

TOTAL OF MONTHLY AVERAGES 575.1 1232.9 181.5

Temperature for 2x CO2

Relative humidity high

1 GFDL 54N110W EST H PHID= 54.00 ALTI= 400.0 PPN= 670.00							NET EVAPOTRANSPIRATION		
YEAR	MONTH	STARTDAY	LENGTH	RELH	T	S	RAD.	POTENT.	AREAL
AVYR	JAN	1	31	.6	-17.7	.420	-38.	2.	2.
AVYR	FEB	1	28	.6	-11.7	.420	-14.	7.	7.
AVYR	MAR	1	31	.5	-3.4	.460	23.	39.	14.
AVYR	APR	1	30	.5	9.0	.500	71.	118.	13.
AVYR	MAY	1	31	.5	13.2	.560	125.	177.	44.
AVYR	JUNE	1	30	.5	14.1	.640	157.	195.	73.
AVYR	JULY	1	31	.5	16.8	.670	156.	215.	70.
AVYR	AUG	1	31	.5	17.2	.670	115.	194.	34.
AVYR	SEPT	1	30	.5	12.4	.550	45.	102.	9.
AVYR	OCT	1	31	.5	7.1	.510	-5.	39.	5.
AVYR	NOV	1	30	.6	-4.7	.460	-28.	9.	5.
AVYR	DEC	1	31	.6	-13.2	.360	-39.	3.	3.

GFDL 54N110W EST H MONTHLY TOTALS AVERAGED OVER 1 YEARS

MONTH	NET RAD.	EVAPOTRANSPIRATION POTENT.	AREAL
JAN	-38.2	1.9	1.9
FEB	-13.8	6.5	6.5
MAR	23.1	38.7	13.6
APR	70.9	117.8	13.2
MAY	125.2	176.6	44.3
JUNE	157.4	195.5	73.4
JULY	156.2	215.2	70.4
AUG	115.0	194.3	34.3
SEPT	45.5	102.3	8.5
OCT	-5.0	38.9	4.7
NOV	-27.5	8.6	4.7
DEC	-38.8	2.9	2.9

TOTAL OF MONTHLY AVERAGES	570.0	1099.1	<u>278.5</u>

APPENDIX H

Application of program FLOWSTOR on Lake Diefenbaker

STORAGE CAPACITY (MIL OF CUBIC M) : 9400.000

MONTH	STORAGE SIZE (MIL OF CUBIC M)		TARGET FLOW (CUBIC M/SEC)
	MINIMUM	MAXIMUM	
1	7000.000	8100.000	330.000
2	6300.000	7450.000	310.000
3	5900.000	7200.000	240.000
4	6000.000	7300.000	170.000
5	6350.000	7800.000	160.000
6	7700.000	8650.000	260.000
7	8650.000	9200.000	230.000
8	8650.000	9200.000	170.000
9	8650.000	8950.000	150.000
10	8550.000	8750.000	160.000
11	8150.000	8650.000	230.000
12	7700.000	8350.000	280.000

CRITICAL FLOW (CUBIC M/SEC) : 9400.0

YEAR	MONTH	INPUT	STORAGE (IN MIL)	FLOW	FLOW-TFLOW
1912	1	51.0	7000.	256.3	-73.7
1912	2	63.5	6404.	310.0	.0
1912	3	131.2	6112.	240.0	.0
1912	4	303.9	6459.	170.0	.0
1912	5	463.8	7273.	160.0	.0
1912	6	675.1	8349.	260.0	.0
1912	7	1079.7	9200.	762.0	532.0
1912	8	560.9	9200.	560.9	390.9
1912	9	436.8	8950.	533.3	383.3
1912	10	283.5	8750.	358.2	198.2
1912	11	192.0	8650.	230.6	.6
1912	12	82.7	8122.	280.0	.0
					1912 MEAN = 350.34
1913	1	56.3	7388.	330.0	.0
1913	2	64.2	6794.	310.0	.0
1913	3	77.3	6358.	240.0	.0
1913	4	468.5	7132.	170.0	.0
1913	5	490.0	7800.	240.5	80.5
1913	6	997.7	8650.	669.8	409.8
1913	7	699.1	9200.	493.8	263.8
1913	8	468.8	9200.	468.8	298.8
1913	9	295.5	8950.	392.0	242.0
1913	10	213.2	8750.	287.9	127.9
1913	11	162.8	8576.	230.0	.0
1913	12	94.2	8078.	280.0	.0
					1913 MEAN = 340.63
914	1	85.0	7422.	330.0	.0
114	2	47.2	6786.	310.0	.0
14	3	129.7	6491.	240.0	.0
4	4	215.2	6608.	170.0	.0
	5	470.6	7440.	160.0	.0

H-1

1914	6	694.7	8567.	260.0	.0
1914	7	508.7	9200.	272.2	42.2
1914	8	251.5	9200.	251.5	81.5
1914	9	183.8	8950.	280.3	130.3
1914	10	279.7	8750.	354.4	194.4
1914	11	192.1	8650.	230.7	.7
1914	12	71.4	8091.	280.0	.0
1914 MEAN = 260.80					
1915	1	75.6	7410.	330.0	.0
1915	2	58.8	6802.	310.0	.0
1915	3	195.2	6682.	240.0	.0
1915	4	223.6	6821.	170.0	.0
1915	5	715.1	7800.	349.6	189.6
1915	6	1297.7	8650.	969.8	709.8
1915	7	1804.2	9200.	1598.9	1368.9
1915	8	822.6	9200.	822.6	652.6
1915	9	425.7	8950.	522.2	372.2
1915	10	343.2	8750.	417.9	257.9
1915	11	180.7	8622.	230.0	.0
1915	12	90.7	8115.	280.0	.0
1915 MEAN = 519.43					
1916	1	55.5	7380.	330.0	.0
1916	2	181.2	7068.	310.0	.0
1916	3	208.8	6985.	240.0	.0
1916	4	314.6	7300.	193.0	23.0
1916	5	444.4	7800.	257.7	97.7
1916	6	1692.7	8650.	1364.8	1104.8
1916	7	1552.8	9200.	1347.5	1117.5
1916	8	736.0	9200.	736.0	566.0
1916	9	727.8	8950.	824.3	674.3
1916	10	385.0	8750.	459.7	299.7
1916	11	237.5	8650.	276.1	46.1
1916	12	113.5	8204.	280.0	.0
1916 MEAN = 554.15					
1917	1	85.6	7549.	330.0	.0
1917	2	77.2	6986.	310.0	.0
1917	3	84.8	6571.	240.0	.0
1917	4	444.8	7283.	170.0	.0
1917	5	1018.5	7800.	825.4	665.4
1917	6	1536.2	8650.	1208.3	948.3
1917	7	740.8	9200.	535.5	305.5
1917	8	323.3	9200.	323.3	153.3
1917	9	228.5	8950.	325.0	175.0
1917	10	190.8	8750.	265.5	105.5
1917	11	122.3	8471.	230.0	.0
1917	12	41.9	7833.	280.0	.0
1917 MEAN = 407.89					
1918	1	101.3	7221.	330.0	.0
1918	2	70.4	6641.	310.0	.0
1918	3	216.8	6579.	240.0	.0
1918	4	262.5	6819.	170.0	.0
1918	5	348.4	7323.	160.0	.0
1918	6	737.2	8560.	260.0	.0
1918	7	382.0	8967.	230.0	.0
1918	8	274.4	9200.	187.5	17.5

FLOWVAR. RES

Page 3

1918	9	198.7	8950.	295.2	145.2	
1918	10	151.7	8750.	226.4	66.4	
1918	11	93.5	8396.	230.0	.0	
1918	12	58.9	7804.	280.0	.0	
						1918 MEAN = 241.32
1919	1	52.1	7060.	330.0	.0	
1919	2	47.6	6425.	310.0	.0	
1919	3	63.0	5951.	240.0	.0	
1919	4	247.5	6152.	170.0	.0	
1919	5	447.2	6921.	160.0	.0	
1919	6	541.6	7700.	241.0	-19.0	
1919	7	313.6	8650.	-41.1	-271.1	
1919	8	335.9	9094.	170.0	.0	
1919	9	172.7	8950.	228.4	78.4	
1919	10	84.3	8747.	160.0	.0	
1919	11	60.2	8307.	230.0	.0	
1919	12	55.5	7706.	280.0	.0	
						1919 MEAN = 201.77
1920	1	48.9	7000.	312.4	-17.6	
1920	2	62.2	6401.	310.0	.0	
1920	3	137.8	6127.	240.0	.0	
1920	4	455.1	6866.	170.0	.0	
1920	5	928.4	7800.	579.6	419.6	
1920	6	745.4	8650.	417.5	157.5	
1920	7	891.9	9200.	686.6	456.6	
1920	8	353.6	9200.	353.6	183.6	
1920	9	171.4	8950.	267.9	117.9	
1920	10	146.8	8750.	221.5	61.5	
1920	11	91.2	8390.	230.0	.0	
1920	12	61.0	7804.	280.0	.0	
						1920 MEAN = 341.14
1921	1	57.1	7073.	330.0	.0	
1921	2	61.3	6471.	310.0	.0	
1921	3	85.8	6058.	240.0	.0	
1921	4	299.3	6393.	170.0	.0	
1921	5	509.3	7329.	160.0	.0	
1921	6	801.0	8650.	291.3	31.3	
1921	7	462.5	9200.	257.2	27.2	
1921	8	241.6	9200.	241.6	71.6	
1921	9	126.2	8950.	222.7	72.7	
1921	10	92.7	8750.	167.4	7.4	
1921	11	77.3	8354.	230.0	.0	
1921	12	57.2	7757.	280.0	.0	
						1921 MEAN = 239.28
1922	1	52.5	7014.	330.0	.0	
1922	2	32.9	6344.	310.0	.0	
1922	3	57.9	5900.	223.6	-16.4	
1922	4	182.2	6000.	143.6	-26.4	
1922	5	468.7	6827.	160.0	.0	
1922	6	779.8	8174.	260.0	.0	
1922	7	422.1	8689.	230.0	.0	
1922	8	257.4	8923.	170.0	.0	
1922	9	159.4	8947.	150.0	.0	
1922	10	90.5	8750.	164.1	4.1	
1922	11	66.1	8325.	230.0	.0	

FLOWVAR.RES

1922	12	38.2	7700.	271.6	-8.4	
						1922 MEAN = 217.31
1923	1	41.9	7000.	303.3	-26.7	
1923	2	30.1	6323.	310.0	.0	
1923	3	64.5	5900.	222.4	-17.6	
1923	4	153.0	6000.	114.4	-55.6	
1923	5	353.7	6519.	160.0	.0	
1923	6	1866.2	8650.	1044.0	784.0	
1923	7	791.0	9200.	585.7	355.7	
1923	8	430.6	9200.	430.6	260.6	
1923	9	243.2	8950.	339.7	189.7	
1923	10	158.1	8750.	232.8	72.8	
1923	11	99.6	8412.	230.0	.0	
1923	12	59.4	7821.	280.0	.0	
						1923 MEAN = 357.61
1924	1	39.1	7042.	330.0	.0	
1924	2	63.8	6446.	310.0	.0	
1924	3	73.0	5999.	240.0	.0	
1924	4	129.8	6000.	129.5	-40.5	
1924	5	448.4	6772.	160.0	.0	
1924	6	722.0	7970.	260.0	.0	
1924	7	501.2	8696.	230.0	.0	
1924	8	416.6	9200.	228.6	58.6	
1924	9	194.7	8950.	291.2	141.2	
1924	10	114.2	8750.	188.9	28.9	
1924	11	93.1	8395.	230.0	.0	
1924	12	65.5	7821.	280.0	.0	
						1924 MEAN = 238.45
1925	1	71.7	7129.	330.0	.0	
1925	2	65.3	6537.	310.0	.0	
1925	3	179.7	6375.	240.0	.0	
1925	4	510.7	7258.	170.0	.0	
1925	5	579.7	7800.	377.5	217.5	
1925	6	786.4	8650.	458.5	198.5	
1925	7	444.9	9200.	239.6	9.6	
1925	8	315.2	9200.	315.2	145.2	
1925	9	253.3	8950.	349.8	199.8	
1925	10	264.1	8750.	338.8	178.8	
1925	11	151.2	8546.	230.0	.0	
1925	12	105.0	8077.	280.0	.0	
						1925 MEAN = 310.60
1926	1	66.4	7371.	330.0	.0	
1926	2	62.6	6772.	310.0	.0	
1926	3	230.2	6746.	240.0	.0	
1926	4	253.5	6963.	170.0	.0	
1926	5	244.9	7190.	160.0	.0	
1926	6	399.9	7700.	203.2	-56.8	
1926	7	373.0	8650.	18.3	-211.7	
1926	8	179.1	8674.	170.0	.0	
1926	9	720.4	8950.	614.1	464.1	
1926	10	441.7	8750.	516.4	356.4	
1926	11	207.4	8650.	246.0	16.0	
1926	12	118.6	8218.	280.0	.0	
						1926 MEAN = 274.81
1927	1	99.5	7600.	330.0	.0	

FLOWVAR.RES

1927	2	73.6	7028.	310.0	.0
1927	3	140.4	6762.	240.0	.0
1927	4	478.2	7300.	270.5	100.5
1927	5	684.8	7800.	498.1	338.1
1927	6	1454.3	8650.	1126.4	866.4
1927	7	886.1	9200.	680.8	450.8
1927	8	564.6	9200.	564.6	394.6
1927	9	608.5	8950.	705.0	555.0
1927	10	342.2	8750.	416.9	256.9
1927	11	199.4	8650.	238.0	8.0
1927	12	118.1	8216.	280.0	.0

1927 MEAN = 470.81

1928	1	290.6	8100.	334.0	4.0
1928	2	127.9	7450.	396.6	86.6
1928	3	347.6	7200.	440.9	200.9
1928	4	313.8	7300.	275.2	105.2
1928	5	651.5	7800.	464.8	304.8
1928	6	1328.8	8650.	1000.9	740.9
1928	7	1149.8	9200.	944.5	714.5
1928	8	338.7	9200.	338.7	168.7
1928	9	243.1	8950.	339.6	189.6
1928	10	206.3	8750.	281.0	121.0
1928	11	130.4	8492.	230.0	.0
1928	12	61.3	7906.	280.0	.0

1928 MEAN = 432.48

1929	1	57.3	7176.	330.0	.0
1929	2	47.5	6541.	310.0	.0
1929	3	132.7	6253.	240.0	.0
1929	4	136.2	6166.	170.0	.0
1929	5	487.0	7041.	160.0	.0
1929	6	1140.6	8650.	520.0	260.0
1929	7	314.7	8877.	230.0	.0
1929	8	168.1	8872.	170.0	.0
1929	9	115.1	8781.	150.0	.0
1929	10	63.1	8550.	149.5	-10.5
1929	11	51.3	8150.	205.6	-24.4
1929	12	54.8	7700.	222.8	-57.2

1929 MEAN = 230.70

1930	1	44.2	7000.	305.6	-24.4
1930	2	136.3	6580.	310.0	.0
1930	3	137.4	6305.	240.0	.0
1930	4	294.1	6627.	170.0	.0
1930	5	450.9	7406.	160.0	.0
1930	6	711.6	8576.	260.0	.0
1930	7	492.5	9200.	259.7	29.7
1930	8	200.4	9200.	200.4	30.4
1930	9	131.5	8950.	228.0	78.0
1930	10	93.1	8750.	167.8	7.8
1930	11	68.1	8330.	230.0	.0
1930	12	66.6	7759.	280.0	.0

1930 MEAN = 235.56

1931	1	49.6	7008.	330.0	.0
1931	2	43.4	6363.	310.0	.0
1931	3	67.7	5901.	240.0	.0
1931	4	110.1	6000.	72.0	-98.0

1931	5	231.5	6350.	100.8	-59.2
1931	6	500.4	7700.	-20.4	-280.4
1931	7	342.3	8650.	-12.4	-242.4
1931	8	171.5	8654.	170.0	.0
1931	9	148.3	8650.	149.8	-.2
1931	10	101.8	8550.	139.1	-20.9
1931	11	81.7	8166.	230.0	.0
1931	12	50.7	7700.	224.5	-55.5

1931 MEAN = 158.25

1932	1	56.4	7000.	317.7	-12.3
1932	2	57.7	6390.	310.0	.0
1932	3	94.7	6000.	240.0	.0
1932	4	193.9	6062.	170.0	.0
1932	5	575.6	7176.	160.0	.0
1932	6	1213.1	8650.	644.3	384.3
1932	7	425.4	9173.	230.0	.0
1932	8	232.6	9200.	222.7	52.7
1932	9	200.5	8950.	297.0	147.0
1932	10	128.2	8750.	202.9	42.9
1932	11	102.5	8420.	230.0	.0
1932	12	70.0	7857.	280.0	.0

1932 MEAN = 279.22

1933	1	58.9	7131.	330.0	.0
1933	2	43.8	6487.	310.0	.0
1933	3	80.5	6060.	240.0	.0
1933	4	264.8	6305.	170.0	.0
1933	5	568.9	7401.	160.0	.0
1933	6	866.1	8650.	384.1	124.1
1933	7	502.1	9200.	296.8	66.8
1933	8	213.1	9200.	213.1	43.1
1933	9	155.0	8950.	251.5	101.5
1933	10	117.0	8750.	191.7	31.7
1933	11	174.1	8605.	230.0	.0
1933	12	100.8	8125.	280.0	.0

1933 MEAN = 262.09

1934	1	137.8	7610.	330.0	.0
1934	2	144.8	7211.	310.0	.0
1934	3	158.5	6992.	240.0	.0
1934	4	498.2	7300.	379.5	209.5
1934	5	669.6	7800.	482.9	322.9
1934	6	726.4	8650.	398.5	138.5
1934	7	315.1	8878.	230.0	.0
1934	8	176.9	8896.	170.0	.0
1934	9	125.7	8833.	150.0	.0
1934	10	107.5	8693.	160.0	.0
1934	11	174.4	8549.	230.0	.0
1934	12	68.7	7983.	280.0	.0

1934 MEAN = 275.30

1935	1	71.7	7291.	330.0	.0
1935	2	130.8	6857.	310.0	.0
1935	3	83.7	6439.	240.0	.0
1935	4	201.2	6520.	170.0	.0
1935	5	329.3	6973.	160.0	.0
1935	6	725.8	8180.	260.0	.0
1935	7	559.2	9062.	230.0	.0

FLOWVAR.RES

Page 7

1935	8	300.0	9200.	248.5	78.5	
1935	9	144.7	8950.	241.2	91.2	
1935	10	99.3	8750.	174.0	14.0	
1935	11	58.0	8304.	230.0	.0	
1935	12	44.0	7700.	269.6	-10.4	
						1935 MEAN = 228.97
1936	1	35.5	7000.	296.8	-33.2	
1936	2	20.9	6301.	310.0	.0	
1936	3	120.2	5980.	240.0	.0	
1936	4	414.8	6614.	170.0	.0	
1936	5	426.2	7327.	160.0	.0	
1936	6	586.7	8174.	260.0	.0	
1936	7	223.5	8650.	45.8	-184.2	
1936	8	151.5	8650.	151.5	-18.5	
1936	9	110.9	8650.	110.9	-39.1	
1936	10	61.6	8550.	98.9	-61.1	
1936	11	42.7	8150.	197.0	-33.0	
1936	12	17.4	7700.	185.4	-94.6	
						1936 MEAN = 184.32
1937	1	8.6	7000.	270.0	-60.0	
1937	2	22.0	6303.	310.0	.0	
1937	3	64.0	5900.	214.6	-25.4	
1937	4	157.7	6000.	119.1	-50.9	
1937	5	262.2	6350.	131.5	-28.5	
1937	6	732.0	7700.	211.2	-48.8	
1937	7	353.9	8650.	-.8	-230.8	
1937	8	211.2	8760.	170.0	.0	
1937	9	126.5	8699.	150.0	.0	
1937	10	111.0	8568.	160.0	.0	
1937	11	110.7	8259.	230.0	.0	
1937	12	63.2	7700.	271.9	-8.1	
						1937 MEAN = 185.25
1938	1	67.1	7000.	328.5	-1.5	
1938	2	31.7	6327.	310.0	.0	
1938	3	110.3	5979.	240.0	.0	
1938	4	264.2	6224.	170.0	.0	
1938	5	552.7	7275.	160.0	.0	
1938	6	879.9	8650.	349.5	89.5	
1938	7	609.5	9200.	404.2	174.2	
1938	8	227.7	9200.	227.7	57.7	
1938	9	175.0	8950.	271.5	121.5	
1938	10	135.3	8750.	210.0	50.0	
1938	11	78.8	8358.	230.0	.0	
1938	12	49.9	7742.	280.0	.0	
						1938 MEAN = 265.17
1939	1	35.8	7000.	312.8	-17.2	
1939	2	21.9	6303.	310.0	.0	
1939	3	107.5	5948.	240.0	.0	
1939	4	183.3	6000.	163.3	-6.7	
1939	5	322.8	6436.	160.0	.0	
1939	6	754.0	7716.	260.0	.0	
1939	7	480.5	8650.	132.0	-98.0	
1939	8	183.3	8686.	170.0	.0	
1939	9	120.5	8650.	134.2	-15.8	
1939	10	96.9	8550.	134.2	-25.8	

H-7

1939	11	103.8	8223.	230.0	.0	
1939	12	60.2	7700.	255.4	-24.6	
						1939 MEAN = 205.88
1940	1	26.4	7000.	287.8	-42.2	
1940	2	37.9	6342.	310.0	.0	
1940	3	101.6	5971.	240.0	.0	
1940	4	392.8	6549.	170.0	.0	
1940	5	479.5	7404.	160.0	.0	
1940	6	442.9	7878.	260.0	.0	
1940	7	283.7	8650.	-4.4	-234.4	
1940	8	174.1	8661.	170.0	.0	
1940	9	207.6	8810.	150.0	.0	
1940	10	161.7	8750.	184.2	24.2	
1940	11	88.7	8384.	230.0	.0	
1940	12	61.9	7800.	280.0	.0	
						1940 MEAN = 204.90
1941	1	40.7	7025.	330.0	.0	
1941	2	42.6	6378.	310.0	.0	
1941	3	119.0	6054.	240.0	.0	
1941	4	158.1	6023.	170.0	.0	
1941	5	193.0	6350.	70.9	-89.1	
1941	6	356.1	7700.	-164.7	-424.7	
1941	7	246.0	8650.	-108.7	-338.7	
1941	8	175.7	8665.	170.0	.0	
1941	9	178.4	8739.	150.0	.0	
1941	10	167.1	8750.	162.9	2.9	
1941	11	103.6	8422.	230.0	.0	
1941	12	80.6	7888.	280.0	.0	
						1941 MEAN = 155.07
1942	1	52.8	7146.	330.0	.0	
1942	2	39.4	6491.	310.0	.0	
1942	3	67.3	6029.	240.0	.0	
1942	4	168.3	6024.	170.0	.0	
1942	5	705.7	7486.	160.0	.0	
1942	6	1069.8	8650.	620.7	360.7	
1942	7	902.5	9200.	697.2	467.2	
1942	8	467.7	9200.	467.7	297.7	
1942	9	357.7	8950.	454.2	304.2	
1942	10	238.2	8750.	312.9	152.9	
1942	11	110.0	8439.	230.0	.0	
1942	12	69.0	7874.	280.0	.0	
						1942 MEAN = 354.03
1943	1	43.2	7106.	330.0	.0	
1943	2	70.1	6525.	310.0	.0	
1943	3	129.6	6230.	240.0	.0	
1943	4	736.5	7300.	323.5	153.5	
1943	5	391.1	7800.	204.4	44.4	
1943	6	787.0	8650.	459.1	199.1	
1943	7	741.2	9200.	535.9	305.9	
1943	8	301.4	9200.	301.4	131.4	
1943	9	151.3	8950.	247.8	97.8	
1943	10	99.2	8750.	173.9	13.9	
1943	11	60.5	8311.	230.0	.0	
1943	12	46.7	7700.	274.7	-5.3	
						1943 MEAN = 296.48

1944	1	42.4	7000.	303.8	-26.3	
1944	2	28.9	6320.	310.0	.0	
1944	3	53.4	5900.	210.2	-29.8	
1944	4	121.4	6000.	82.8	-87.2	
1944	5	195.4	6350.	64.7	-95.3	
1944	6	564.3	7700.	43.5	-216.5	
1944	7	333.4	8650.	-21.3	-251.3	
1944	8	348.1	9127.	170.0	.0	
1944	9	169.5	8950.	237.8	87.8	
1944	10	116.1	8750.	190.8	30.8	
1944	11	70.9	8338.	230.0	.0	
1944	12	48.9	7719.	280.0	.0	
						1944 MEAN = 174.39
1945	1	37.6	7000.	305.9	-24.1	
1945	2	33.6	6331.	310.0	.0	
1945	3	106.0	5972.	240.0	.0	
1945	4	116.2	6000.	105.6	-64.4	
1945	5	396.7	6634.	160.0	.0	
1945	6	967.0	8467.	260.0	.0	
1945	7	587.4	9200.	313.6	83.6	
1945	8	221.7	9200.	221.7	51.7	
1945	9	218.7	8950.	315.2	165.2	
1945	10	192.8	8750.	267.5	107.5	
1945	11	102.6	8420.	230.0	.0	
1945	12	80.3	7885.	280.0	.0	
						1945 MEAN = 255.05
1946	1	77.0	7207.	330.0	.0	
1946	2	54.3	6589.	310.0	.0	
1946	3	161.4	6378.	240.0	.0	
1946	4	238.4	6555.	170.0	.0	
1946	5	434.3	7290.	160.0	.0	
1946	6	934.8	8650.	410.2	150.2	
1946	7	503.9	9200.	298.6	68.6	
1946	8	218.0	9200.	218.0	48.0	
1946	9	272.6	8950.	369.1	219.1	
1946	10	178.0	8750.	252.7	92.7	
1946	11	113.0	8447.	230.0	.0	
1946	12	102.9	7972.	280.0	.0	
						1946 MEAN = 274.05
1947	1	83.1	7311.	330.0	.0	
1947	2	109.3	6826.	310.0	.0	
1947	3	316.0	7029.	240.0	.0	
1947	4	452.0	7300.	347.5	177.5	
1947	5	778.5	7800.	591.8	431.8	
1947	6	861.0	8650.	533.1	273.1	
1947	7	539.8	9200.	334.5	104.5	
1947	8	265.7	9200.	265.7	95.7	
1947	9	272.8	8950.	369.3	219.3	
1947	10	341.5	8750.	416.2	256.2	
1947	11	182.1	8626.	230.0	.0	
1947	12	89.3	8115.	280.0	.0	
						1947 MEAN = 357.59
1948	1	76.0	7435.	330.0	.0	
1948	2	45.7	6795.	310.0	.0	
1948	3	104.4	6432.	240.0	.0	

1948	4	764.4	7300.	429.6	259.6
1948	5	1670.8	7800.	1484.1	1324.1
1948	6	1723.9	8650.	1396.0	1136.0
1948	7	631.8	9200.	426.5	196.5
1948	8	454.9	9200.	454.9	284.9
1948	9	192.0	8950.	288.5	138.5
1948	10	124.9	8750.	199.6	39.6
1948	11	82.7	8368.	230.0	.0
1948	12	43.0	7733.	280.0	.0
1948 MEAN = 492.88					
1949	1	60.2	7011.	330.0	.0
1949	2	34.7	6345.	310.0	.0
1949	3	63.8	5900.	229.9	-10.1
1949	4	236.2	6072.	170.0	.0
1949	5	424.7	6781.	160.0	.0
1949	6	510.4	7700.	155.7	-104.3
1949	7	266.5	8650.	-88.2	-318.2
1949	8	169.1	8650.	169.1	-.9
1949	9	122.1	8650.	122.1	-27.9
1949	10	98.8	8550.	136.1	-23.9
1949	11	94.4	8199.	230.0	.0
1949	12	58.8	7700.	244.9	-35.1
1949 MEAN = 178.31					
1950	1	44.2	7000.	305.6	-24.4
1950	2	61.5	6399.	310.0	.0
1950	3	96.6	6015.	240.0	.0
1950	4	262.7	6255.	170.0	.0
1950	5	389.2	6869.	160.0	.0
1950	6	963.6	8650.	276.5	16.5
1950	7	718.9	9200.	513.6	283.6
1950	8	306.6	9200.	306.6	136.6
1950	9	152.6	8950.	249.1	99.1
1950	10	140.0	8750.	214.7	54.7
1950	11	116.7	8456.	230.0	.0
1950	12	80.6	7922.	280.0	.0
1950 MEAN = 277.77					
1951	1	63.7	7209.	330.0	.0
1951	2	57.6	6598.	310.0	.0
1951	3	101.1	6226.	240.0	.0
1951	4	483.9	7040.	170.0	.0
1951	5	1037.7	7800.	753.9	593.9
1951	6	1182.8	8650.	854.9	594.9
1951	7	1199.3	9200.	994.0	764.0
1951	8	468.4	9200.	468.4	298.4
1951	9	835.9	8950.	932.4	782.4
1951	10	496.6	8750.	571.3	411.3
1951	11	283.9	8650.	322.5	92.5
1951	12	139.0	8272.	280.0	.0
1951 MEAN = 529.16					
1952	1	125.7	7725.	330.0	.0
1952	2	114.6	7252.	310.0	.0
1952	3	163.4	7047.	240.0	.0
1952	4	955.5	7300.	858.0	688.0
1952	5	591.6	7800.	404.9	244.9
1952	6	886.2	8650.	558.3	298.3

1952	7	689.9	9200.	484.6	254.6
1952	8	383.0	9200.	383.0	213.0
1952	9	204.4	8950.	300.9	150.9
1952	10	144.7	8750.	219.4	59.4
1952	11	87.6	8381.	230.0	.0
1952	12	55.4	7779.	280.0	.0
					1952 MEAN = 366.83
1953	1	52.8	7037.	330.0	.0
1953	2	78.5	6477.	310.0	.0
1953	3	94.9	6088.	240.0	.0
1953	4	272.9	6355.	170.0	.0
1953	5	725.1	7800.	185.6	25.6
1953	6	2040.1	8650.	1712.2	1452.2
1953	7	940.6	9200.	735.3	505.3
1953	8	392.5	9200.	392.5	222.5
1953	9	251.2	8950.	347.7	197.7
1953	10	157.3	8750.	232.0	72.0
1953	11	111.3	8442.	230.0	.0
1953	12	69.8	7879.	280.0	.0
					1953 MEAN = 432.25
1954	1	57.6	7150.	330.0	.0
1954	2	97.4	6635.	310.0	.0
1954	3	89.2	6232.	240.0	.0
1954	4	288.0	6537.	170.0	.0
1954	5	828.4	7800.	357.0	197.0
1954	6	1166.8	8650.	838.9	578.9
1954	7	941.2	9200.	735.9	505.9
1954	8	644.8	9200.	644.8	474.8
1954	9	673.2	8950.	769.7	619.7
1954	10	322.1	8750.	396.8	236.8
1954	11	204.6	8650.	243.2	13.2
1954	12	86.1	8131.	280.0	.0
					1954 MEAN = 449.95
1955	1	61.6	7412.	330.0	.0
1955	2	57.4	6801.	310.0	.0
1955	3	64.6	6331.	240.0	.0
1955	4	482.8	7142.	170.0	.0
1955	5	648.6	7800.	402.8	242.8
1955	6	968.2	8650.	640.3	380.3
1955	7	774.0	9200.	568.7	338.7
1955	8	291.0	9200.	291.0	121.0
1955	9	173.5	8950.	270.0	120.0
1955	10	171.4	8750.	246.1	86.1
1955	11	118.8	8462.	230.0	.0
1955	12	74.6	7912.	280.0	.0
					1955 MEAN = 323.88
1956	1	92.3	7275.	330.0	.0
1956	2	49.6	6645.	310.0	.0
1956	3	162.8	6438.	240.0	.0
1956	4	475.1	7229.	170.0	.0
1956	5	626.2	7800.	413.0	253.0
1956	6	935.7	8650.	607.8	347.8
1956	7	654.3	9200.	449.0	219.0
1956	8	309.5	9200.	309.5	139.5
1956	9	185.8	8950.	282.3	132.3

FLOWVAR.RES

1956	10	132.9	8750.	207.6	47.6	
1956	11	86.1	8377.	230.0	.0	
1956	12	67.3	7807.	280.0	.0	1956 MEAN = 314.80
1957	1	56.4	7075.	330.0	.0	
1957	2	47.0	6438.	310.0	.0	
1957	3	149.1	6195.	240.0	.0	
1957	4	241.9	6381.	170.0	.0	
1957	5	812.5	7800.	282.8	122.8	
1957	6	715.2	8650.	387.3	127.3	
1957	7	337.4	8938.	230.0	.0	
1957	8	206.6	9036.	170.0	.0	
1957	9	153.0	8950.	186.1	36.1	
1957	10	134.5	8750.	209.2	49.2	
1957	11	147.0	8535.	230.0	.0	
1957	12	81.4	8003.	280.0	.0	1957 MEAN = 256.83
1958	1	49.0	7250.	330.0	.0	
1958	2	47.4	6615.	310.0	.0	
1958	3	93.4	6222.	240.0	.0	
1958	4	495.2	7065.	170.0	.0	
1958	5	693.8	7800.	419.5	259.5	
1958	6	770.3	8650.	442.4	182.4	
1958	7	630.2	9200.	424.9	194.9	
1958	8	279.3	9200.	279.3	109.3	
1958	9	176.5	8950.	273.0	123.0	
1958	10	133.4	8750.	208.1	48.1	
1958	11	113.1	8447.	230.0	.0	
1958	12	93.0	7946.	280.0	.0	1958 MEAN = 297.88
1959	1	62.2	7229.	330.0	.0	
1959	2	59.9	6624.	310.0	.0	
1959	3	130.4	6330.	240.0	.0	
1959	4	203.4	6417.	170.0	.0	
1959	5	461.5	7224.	160.0	.0	
1959	6	948.0	8650.	398.0	138.0	
1959	7	684.7	9200.	479.4	249.4	
1959	8	293.7	9200.	293.7	123.7	
1959	9	235.4	8950.	331.9	181.9	
1959	10	181.0	8750.	255.7	95.7	
1959	11	164.1	8579.	230.0	.0	
1959	12	117.2	8143.	280.0	.0	1959 MEAN = 295.13
1960	1	73.7	7457.	330.0	.0	
1960	2	70.4	6877.	310.0	.0	
1960	3	205.1	6784.	240.0	.0	
1960	4	364.8	7288.	170.0	.0	
1960	5	400.7	7800.	209.7	49.7	
1960	6	680.0	8650.	352.1	92.1	
1960	7	532.0	9200.	326.7	96.7	
1960	8	280.5	9200.	280.5	110.5	
1960	9	152.8	8950.	249.3	99.3	
1960	10	101.1	8750.	175.8	15.8	
1960	11	74.1	8346.	230.0	.0	
1960	12	58.4	7752.	280.0	.0	

					1960 MEAN = 249.47
1961	1	63.9	7040.	330.0	.0
1961	2	55.8	6425.	310.0	.0
1961	3	111.3	6080.	240.0	.0
1961	4	122.4	6000.	153.3	-16.7
1961	5	499.7	6910.	160.0	.0
1961	6	948.3	8650.	276.9	16.9
1961	7	323.4	8900.	230.0	.0
1961	8	269.9	9168.	170.0	.0
1961	9	147.5	8950.	231.5	81.5
1961	10	183.9	8750.	258.6	98.6
1961	11	131.8	8495.	230.0	.0
1961	12	55.6	7894.	280.0	.0
					1961 MEAN = 242.79
1962	1	70.7	7200.	330.0	.0
1962	2	108.4	6712.	310.0	.0
1962	3	110.3	6365.	240.0	.0
1962	4	333.8	6789.	170.0	.0
1962	5	348.5	7294.	160.0	.0
1962	6	654.7	8317.	260.0	.0
1962	7	422.7	8833.	230.0	.0
1962	8	263.0	9083.	170.0	.0
1962	9	183.3	8950.	234.4	84.4
1962	10	127.8	8750.	202.5	42.5
1962	11	100.8	8415.	230.0	.0
1962	12	66.6	7844.	280.0	.0
					1962 MEAN = 232.55
1963	1	43.2	7075.	330.0	.0
1963	2	84.4	6530.	310.0	.0
1963	3	148.4	6284.	240.0	.0
1963	4	177.3	6303.	170.0	.0
1963	5	293.6	6661.	160.0	.0
1963	6	803.3	8069.	260.0	.0
1963	7	801.2	9200.	379.0	149.0
1963	8	305.6	9200.	305.6	135.6
1963	9	186.4	8950.	282.9	132.9
1963	10	120.7	8750.	195.4	35.4
1963	11	77.3	8354.	230.0	.0
1963	12	72.0	7797.	280.0	.0
					1963 MEAN = 259.45
1964	1	58.5	7070.	330.0	.0
1964	2	61.0	6468.	310.0	.0
1964	3	55.5	5973.	240.0	.0
1964	4	151.6	6000.	141.3	-28.7
1964	5	578.7	7121.	160.0	.0
1964	6	1326.7	8650.	737.0	477.0
1964	7	655.7	9200.	450.4	220.4
1964	8	248.3	9200.	248.3	78.3
1964	9	187.2	8950.	283.7	133.7
1964	10	191.0	8750.	265.7	105.7
1964	11	125.6	8479.	230.0	.0
1964	12	46.6	7854.	280.0	.0
					1964 MEAN = 307.20
1965	1	57.6	7125.	330.0	.0
1965	2	75.5	6557.	310.0	.0

FLOWVAR.RES

1965	3	102.2	6188.	240.0	.0
1965	4	497.4	7037.	170.0	.0
1965	5	422.2	7739.	160.0	.0
1965	6	1223.2	8650.	871.8	611.8
1965	7	1097.2	9200.	891.9	661.9
1965	8	442.4	9200.	442.4	272.4
1965	9	374.5	8950.	471.0	321.0
1965	10	334.8	8750.	409.5	249.5
1965	11	186.5	8637.	230.0	.0
1965	12	92.1	8134.	280.0	.0

1965 MEAN = 408.80

1966	1	62.2	7417.	330.0	.0
1966	2	54.9	6800.	310.0	.0
1966	3	245.7	6815.	240.0	.0
1966	4	404.1	7300.	216.9	46.9
1966	5	501.3	7800.	314.6	154.6
1966	6	1016.9	8650.	689.0	429.0
1966	7	706.6	9200.	501.3	271.3
1966	8	342.7	9200.	342.7	172.7
1966	9	217.0	8950.	313.5	163.5
1966	10	165.9	8750.	240.6	80.6
1966	11	119.6	8464.	230.0	.0
1966	12	75.2	7915.	280.0	.0

1966 MEAN = 326.01

1967	1	65.7	7207.	330.0	.0
1967	2	60.4	6604.	310.0	.0
1967	3	123.6	6292.	240.0	.0
1967	4	342.5	6739.	170.0	.0
1967	5	797.3	7800.	401.1	241.1
1967	6	1629.5	8650.	1301.6	1041.6
1967	7	753.2	9200.	547.9	317.9
1967	8	307.2	9200.	307.2	137.2
1967	9	173.9	8950.	270.4	120.4
1967	10	128.2	8750.	202.9	42.9
1967	11	117.6	8459.	230.0	.0
1967	12	37.2	7808.	280.0	.0

1967 MEAN = 378.03

1968	1	63.2	7094.	330.0	.0
1968	2	61.1	6492.	310.0	.0
1968	3	161.8	6282.	240.0	.0
1968	4	118.9	6150.	170.0	.0
1968	5	311.0	6554.	160.0	.0
1968	6	785.5	7916.	260.0	.0
1968	7	521.0	8696.	230.0	.0
1968	8	309.4	9069.	170.0	.0
1968	9	247.0	8950.	292.9	142.9
1968	10	259.2	8750.	333.9	173.9
1968	11	142.9	8524.	230.0	.0
1968	12	59.9	7935.	280.0	.0

1968 MEAN = 253.41

1969	1	61.1	7214.	330.0	.0
1969	2	66.8	6626.	310.0	.0
1969	3	135.1	6345.	240.0	.0
1969	4	602.2	7300.	233.8	63.8
1969	5	624.1	7800.	437.4	277.4

H-14

1969	6	906.8	8650.	578.9	318.9	
1969	7	1120.4	9200.	915.1	685.1	
1969	8	300.0	9200.	300.0	130.0	
1969	9	184.2	8950.	280.7	130.7	
1969	10	155.8	8750.	230.5	70.5	
1969	11	104.0	8423.	230.0	.0	
1969	12	57.9	7829.	280.0	.0	
						1969 MEAN = 359.87
1970	1	42.1	7057.	330.0	.0	
1970	2	54.9	6440.	310.0	.0	
1970	3	86.0	6028.	240.0	.0	
1970	4	253.9	6245.	170.0	.0	
1970	5	442.0	7001.	160.0	.0	
1970	6	1111.1	8650.	474.8	214.8	
1970	7	518.8	9200.	313.5	83.5	
1970	8	219.9	9200.	219.9	49.9	
1970	9	140.8	8950.	237.3	87.3	
1970	10	118.9	8750.	193.6	33.6	
1970	11	86.9	8379.	230.0	.0	
1970	12	34.2	7721.	280.0	.0	
						1970 MEAN = 259.12
1971	1	47.9	7000.	317.0	-13.0	
1971	2	113.6	6525.	310.0	.0	
1971	3	102.5	6157.	240.0	.0	
1971	4	585.8	7234.	170.0	.0	
1971	5	596.1	7800.	384.9	224.9	
1971	6	1062.6	8650.	734.7	474.7	
1971	7	523.0	9200.	317.7	87.7	
1971	8	302.0	9200.	302.0	132.0	
1971	9	161.8	8950.	258.3	108.3	
1971	10	114.2	8750.	188.9	28.9	
1971	11	104.6	8425.	230.0	.0	
1971	12	33.4	7764.	280.0	.0	
						1971 MEAN = 312.29
1972	1	32.5	7000.	317.9	-12.1	
1972	2	39.8	6346.	310.0	.0	
1972	3	271.6	6431.	240.0	.0	
1972	4	301.6	6772.	170.0	.0	
1972	5	627.8	7800.	244.0	84.0	
1972	6	1280.0	8650.	952.1	692.1	
1972	7	756.9	9200.	551.6	321.6	
1972	8	427.5	9200.	427.5	257.5	
1972	9	256.6	8950.	353.1	203.1	
1972	10	186.6	8750.	261.3	101.3	
1972	11	126.3	8481.	230.0	.0	
1972	12	50.5	7867.	280.0	.0	
						1972 MEAN = 363.14
1973	1	71.7	7175.	330.0	.0	
1973	2	64.0	6580.	310.0	.0	
1973	3	137.4	6305.	240.0	.0	
1973	4	272.4	6570.	170.0	.0	
1973	5	484.7	7440.	160.0	.0	
1973	6	827.6	8650.	360.7	100.7	
1973	7	498.1	9200.	292.8	62.8	
1973	8	261.2	9200.	261.2	91.2	

1973	9	204.6	8950.	301.1	151.1
1973	10	116.3	8750.	191.0	31.0
1973	11	82.6	8368.	230.0	.0
1973	12	82.6	7839.	280.0	.0
1973 MEAN = 258.60					
1974	1	53.3	7098.	330.0	.0
1974	2	76.1	6532.	310.0	.0
1974	3	85.2	6118.	240.0	.0
1974	4	501.5	6977.	170.0	.0
1974	5	780.1	7800.	472.8	312.8
1974	6	1266.6	8650.	938.7	678.7
1974	7	730.6	9200.	525.3	295.3
1974	8	364.4	9200.	364.4	194.4
1974	9	229.7	8950.	326.2	176.2
1974	10	149.4	8750.	224.1	64.1
1974	11	90.5	8388.	230.0	.0
1974	12	58.4	7795.	280.0	.0
1974 MEAN = 365.48					
1975	1	42.7	7025.	330.0	.0
1975	2	33.5	6356.	310.0	.0
1975	3	63.0	5900.	233.4	-6.6
1975	4	230.1	6056.	170.0	.0
1975	5	575.9	7170.	160.0	.0
1975	6	1069.2	8650.	498.1	238.1
1975	7	713.9	9200.	508.6	278.6
1975	8	324.5	9200.	324.5	154.5
1975	9	212.7	8950.	309.2	159.2
1975	10	147.6	8750.	222.3	62.3
1975	11	105.5	8427.	230.0	.0
1975	12	87.1	7911.	280.0	.0
1975 MEAN = 300.48					
1976	1	91.5	7272.	330.0	.0
1976	2	92.7	6746.	310.0	.0
1976	3	129.1	6449.	240.0	.0
1976	4	226.4	6595.	170.0	.0
1976	5	515.4	7547.	160.0	.0
1976	6	543.2	8281.	260.0	.0
1976	7	520.9	9060.	230.0	.0
1976	8	548.1	9200.	496.0	326.0
1976	9	290.1	8950.	386.6	236.6
1976	10	161.4	8750.	236.1	76.1
1976	11	72.6	8342.	230.0	.0
1976	12	53.5	7735.	280.0	.0
1976 MEAN = 270.41					
1977	1	43.5	7000.	318.1	-11.9
1977	2	65.3	6408.	310.0	.0
1977	3	81.5	5983.	240.0	.0
1977	4	126.2	6000.	119.8	-50.2
1977	5	292.9	6356.	160.0	.0
1977	6	413.8	7700.	-104.7	-364.7
1977	7	228.3	8650.	-126.4	-356.4
1977	8	254.5	8876.	170.0	.0
1977	9	232.4	8950.	204.0	54.0
1977	10	155.7	8750.	230.4	70.4
1977	11	73.9	8345.	230.0	.0

1977	12	44.5	7715.	280.0	.0	
						1977 MEAN = 167.71
1978	1	31.5	7000.	298.3	-31.7	
1978	2	34.3	6333.	310.0	.0	
1978	3	141.4	6069.	240.0	.0	
1978	4	303.3	6414.	170.0	.0	
1978	5	493.2	7307.	160.0	.0	
1978	6	841.8	8650.	323.6	63.6	
1978	7	617.2	9200.	411.9	181.9	
1978	8	345.8	9200.	345.8	175.8	
1978	9	297.3	8950.	393.8	243.8	
1978	10	197.3	8750.	272.0	112.0	
1978	11	95.9	8402.	230.0	.0	
1978	12	89.1	7891.	280.0	.0	
						1978 MEAN = 290.68
1979	1	31.9	7093.	330.0	.0	
1979	2	27.1	6408.	310.0	.0	
1979	3	159.5	6193.	240.0	.0	
1979	4	186.9	6236.	170.0	.0	
1979	5	479.3	7092.	160.0	.0	
1979	6	627.9	8045.	260.0	.0	
1979	7	374.7	8650.	148.9	-81.1	
1979	8	207.8	8751.	170.0	.0	
1979	9	150.6	8753.	150.0	.0	
1979	10	90.1	8566.	160.0	.0	
1979	11	67.4	8150.	227.7	-2.3	
1979	12	36.2	7700.	204.2	-75.8	
						1979 MEAN = 203.28
1980	1	29.7	7000.	291.1	-38.9	
1980	2	40.7	6349.	310.0	.0	
1980	3	69.5	5900.	237.0	-3.0	
1980	4	295.0	6224.	170.0	.0	
1980	5	620.5	7457.	160.0	.0	
1980	6	903.9	8650.	443.8	183.8	
1980	7	366.4	9015.	230.0	.0	
1980	8	242.8	9200.	173.9	3.9	
1980	9	206.6	8950.	303.1	153.1	
1980	10	181.7	8750.	256.4	96.4	
1980	11	121.1	8468.	230.0	.0	
1980	12	67.1	7898.	280.0	.0	
						1980 MEAN = 262.08
1981	1	104.4	7293.	330.0	.0	
1981	2	109.1	6807.	310.0	.0	
1981	3	149.7	6565.	240.0	.0	
1981	4	154.7	6526.	170.0	.0	
1981	5	886.2	7800.	410.4	250.4	
1981	6	946.7	8650.	618.8	358.8	
1981	7	737.7	9200.	532.4	302.4	
1981	8	562.9	9200.	562.9	392.9	
1981	9	214.7	8950.	311.2	161.2	
1981	10	141.2	8750.	215.9	55.9	
1981	11	103.7	8423.	230.0	.0	
1981	12	40.4	7781.	280.0	.0	
						1981 MEAN = 345.95
1982	1	12.3	7000.	303.8	-26.2	

H-17

FLOWVAR.RES

1982	2	36.2	6338.	310.0	.0
1982	3	60.9	5900.	224.3	-15.7
1982	4	240.7	6083.	170.0	.0
1982	5	343.8	6576.	160.0	.0
1982	6	810.3	8002.	260.0	.0
1982	7	726.2	9200.	278.9	48.9
1982	8	283.6	9200.	283.6	113.6
1982	9	194.0	8950.	290.5	140.5
1982	10	167.1	8750.	241.8	81.8
1982	11	71.0	8338.	230.0	.0
1982	12	43.8	7705.	280.0	.0

1982 MEAN = 249.16

RELIABILITY (IN %) OVER 71 YEAR PERIOD : 89.9
 FLOW ABOVE CRITICAL (IN %) : .0

MEAN : 299.052
 S : 89.861
 MEAN(LN) : 5.658
 S(LN) : .291

H-18

Haas, Jiri
Assessing the effect of climate change on
the operation of a water-supply reservoir...
EC IW no.114 1988 v.2

RSN=00010855