Water Resources Series No. 69

CLIMATIC AND SNOW COURSE DATA OUTPUT PROGRAMS
IN THE
WATER RESOURCES DATA SYSTEM

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ABSTRACT

The Water Resources Data System (WRDS) is a computerized system for
storage, retrieval and analysis of surface water, water quality, climatic
and snow course data. This report describes for climatic and snow course
data the kinds of data stored, methods of retrieval, kinds of analyses,
how users may obtain data and user costs on the current sytem.

ACKNOWLEDGMENTS

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INTRODUCTION

The Water Resources Data System (WRDS) is a computerized storage, retrieval and analysis system for water resources data that is under development at the Wyoming Water Resources Research Institute. The kinds of data included are surface water, water quality, climatic and snow course. Portions of the system are completed and fully operational. This report describes the climatic and snow course portion so that potential users may learn and make use of it. The other portions of WRDS are described in the Water Resources Series No. 61, Water Resources Data System (Smith, et al., 1976).

The system contains a vast and growing amount of data. It is a fast, effective and easy way to obtain large or small amounts of information while eliminating considerable time tabulating and calculating. Persons interested in requesting data or having questions regarding the system can write the Water Resources Research Institute, Box 3067, University Station, Laramie, Wyoming 82071. A more expedient approach is to telephone Vicki Pelton or Verne Smith at 307-766-2143.

User requests are normally submitted to the computer the same day that they are received. Results are generally in the mail the following day. Small requests sometimes are filled in the same day as received and large requests may require a week. Charges for services are given in the appendix.

SUMMARY OF PROGRAMS

AVEPREC -- prints average daily precipitation for given year range;
         prints number of days to get specific percentages
CUM -- plots cumulative total for daily precipitation
DAILYPRINTP -- prints daily precipitation values calculated from hourly
              precipitation values
DEGREE -- prints daily degree day temperatures
DOUBLEMASS -- prints and plots doublemass curve for annual precipitation
             using daily values to compute annual value
LISTDATAD -- prints daily data
LISTDATAH -- prints hourly climatic data (precipitation excluded)
LISTDATAP -- prints hourly precipitation
LISTDATESD -- prints dates for daily data
LISTDATESP -- prints dates of hourly precipitation
MONTHLY -- prints monthly and annual summaries of daily data
NORMALTEMP -- prints normal temperatures for 1941 to 1970 for daily data
OCCUR -- prints and plots number of occurrences of daily precipitation
        in each of 18 class sizes
PARGREATER -- prints number of days a type of daily data was greater
             than or less than specified values
PLOTDAYD -- plots daily climatic data
PLOTDAYP -- plots daily precipitation calculated from hourly
           precipitation
PLOTHOURP -- plots hourly precipitation
PLOTMONTH -- plots monthly summaries from daily data
PLOTYEAR -- plots yearly summaries from daily data
PLRUNOFF -- plots monthly runoff and monthly precipitation from daily
           data
RUN -- prints and plots running average for annual precipitation
      from daily data
SNOWCOURSE -- prints snow course data and/or statistics
SNOWDATES -- prints stations and years of snow course data

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SNOWGREATER -- prints summary values for snowfall and snowdepth for
              daily data

STORM -- prints storm data calculated from hourly precipitation

TEMPBELOW -- prints summary values of daily minimum temperature data
             for specific categories

CLIMATIC DATA

Five classifications of climatic data from weather stations in Wyoming are stored in WRDS. These are:

1) Daily observations for

    mean daily air temperature (F.)
    maximum air temperature (F.)
    minimum air temperature (F.)
    precipitation (inches)
    snowfall (inches) (by water year)
    snowdepth (inches) (by water year)
    wind (miles)
    evaporation (inches)

There are presently 324 daily observation stations in WRDS. Data for some stations are complete from 1899 through 1975. For others only data from 1948 to 1975 are presently stored. The stations and years of available data are too numerous to list here. A complete listing of available daily data can be obtained by requesting LISTDATESD described below.

2) Hourly observations for precipitation (inches)

There are presently 123 hourly precipitation stations in WRDS. Data from 1948 to 1975 are stored although not all stations have all of these years. A complete listing of available data can be obtained by requesting LISTDATESP described below.

3) Hourly observations for National Weather Service airways stations for

    air temperature (F.)
    wet bulb temperature (F.)
    dew point (F.)
    relative humidity (percent)
    wind speed (miles)
    wind direction (16 points)

The 12 hourly observation stations and year ranges are listed below. Hourly observations were made from 1948 to 1964.

Station number	Station name	Year range
24016	Casper/Wardell Field	01/48-03/50
24089	Casper/Air Terminal	03/50-12/76
24018	Cheyenne Municipal	01/48-12/76
24019	Douglas	01/48-12/54
24118	Fort Bridger	01/48-12/54
24021	Lander/Hunt	01/48-12/76
24022	Laramie/General Brees	01/48-12/54
24088	Moorcroft	01/50-07/52
24057	Rawlins/Municipal	01/55-12/64
24027	Rock Springs/Municipal	01/48-12/76
24029	Sheridan/County	01/48-12/76
24031	Sinclair	01/48-02/51

4) Three hour observation for National Weather Service airways stations for the same data types and stations as hourly observations; three-hour observations began in 1965.

5) Six hour observations for miscellaneous stations

Observations for several research and special study sites are stored as six hour observations.

Computer programs have been written to easily retrieve these data as described below. Each program can use only some of the available parameters. After each program description the parameters that may be used are listed as "parameters that may be used." Values can always be printed in the units listed above (for example, inches). When a program can print values in other units, these are listed after each program as "other units that may be used."

When several parameters can be used by one program, only some of the parameters are shown as examples. These will show the types of printouts that are available.

When daily values are missing for precipitation or evaporation, monthly and annual values are sometimes estimated. The treatment of these estimated values is discussed under appropriate program descriptions.

AVEPREC

This program prints average daily precipitation and their monthly totals for a specific station and year range. It also prints the number of days needed to get the given percentage of the average annual precipitation for the following percentages: 10, 25, 35, 50, 67, 75 and 90. Other units that may be used: centimeters.

KEELINE (KEELINE 2SW 1953-1963)   STATION NO. 485085
AVERAGE DAILY PRECIPITATION (INCHES) FOR 1958 TO 1960

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	.02	.06	.04	.98	.00	.04	.00	.00	.00	.02	.02	.00
2	.03	.00	.05	.08	.00	.00	.00	.00	.00	.01	.00	.00
3	.00	.03	.00	.00	.00	.00	.01	.00	.00	.00	.02	.01
4	.00	.00	.04	.25	.35	.00	.07	.00	.00	.00	.08	.23
5	.00	.00	.00	.16	.15	.00	.05	.00	.10	.00	.00	.04
6	.00	.05	.00	.03	.00	.00	.02	.00	.00	.00	.00	.00
7	.00	.00	.00	.01	.08	.18	.04	.00	.35	.02	.05	.00
8	.05	.02	.00	.00	.00	.18	.02	.00	.01	.00	.06	.05
9	.00	.12	.02	.01	.00	.00	.00	.00	.02	.02	.06	.00
10	.00	.02	.09	.12	.05	.01	.11	.00	.01	.00	.00	.00
11	.00	.03	.00	.06	.00	.01	.00	.00	.01	.00	.01	.02
12	.00	.00	.00	.01	.00	.15	.00	.00	.00	.00	.00	.04
13	.00	.00	.00	.00	.00	.03	.00	.00	.00	.00	.03	.02
14	.07	.03	.13	.00	.13	.02	.01	.08	.00	.04	.00	.31
15	.00	.00	.03	.00	.07	.06	.03	.00	.10	.00	.00	.00
16	.08	.04	.03	.10	.01	.02	.10	.02	.15	.05	.07	.00
17	.02	.02	.01	.04	.06	.00	.04	.02	.03	.00	.04	.00
18	.02	.02	.02	.00	.00	.00	.00	.00	.02	.00	.00	.00
19	.00	.01	.00	.02	.00	.06	.15	.00	.00	.00	.00	.00
20	.00	.00	.12	.00	.27	.18	.09	.00	.00	.00	.00	.00
21	.00	.00	.00	.05	.00	.08	.00	.00	.00	.01	.00	.04
22	.00	.12	.00	.05	.25	.00	.00	.00	.00	.00	.02	.00
23	.00	.00	.06	.07	.25	.10	.00	.00	.00	.00	.00	.00
24	.00	.00	.03	.03	.00	.10	.01	.01	.04	.00	.00	.00
25	.00	.04	.08	.00	.00	.03	.00	.00	.15	.00	.01	.00
26	.03	.03	.19	.00	.01	.01	.01	.00	.04	.00	.00	.00
27	.00	.05	.11	.03	.10	.00	.05	.00	.03	.00	.05	.00
28	.00	.07	.21	.96	.00	.00	.01	.00	.00	.00	.00	.00
29	.02		.00	.01	.00	.30	.00	.00	.03	.02	.01	.00
30	.00		.10	.00	.01	.18	.10	.00	.03	.07	.00	.00
31	.00		.01		.00		.00	.00		.00		.00
TOTAL	.25	.74	1.12	1.26	1.68	1.88	.94	.18	1.29	.27	.52	.57

AVERAGE YEARLY TOTAL = 10.72

NUMBER OF DAYS NEEDED TO GET GIVEN PERCENTAGE
OF AVERAGE ANNUAL PRECIPITATION FOR 1958 TO 1960

PERCENT	NUMBER OF DAYS
10	61
25	95
35	124
50	159
67	191
75	235
90	305

Example of AVEPREC

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CUM

This program plots the cumulative total for daily precipitation.
Each year is plotted on a separate graph. When missing data are
encountered the plot for that year is stopped.

Example of CUM

LAKE YELLOWSTONE (YNP)
LATITUDE 443400 LONGITUDE 1102400 ELEVATION 7731
STATION NO. 485345

CUMMULATIVE PRECIPITATION (INCHES)

J F M A M J J A S O N D
1915
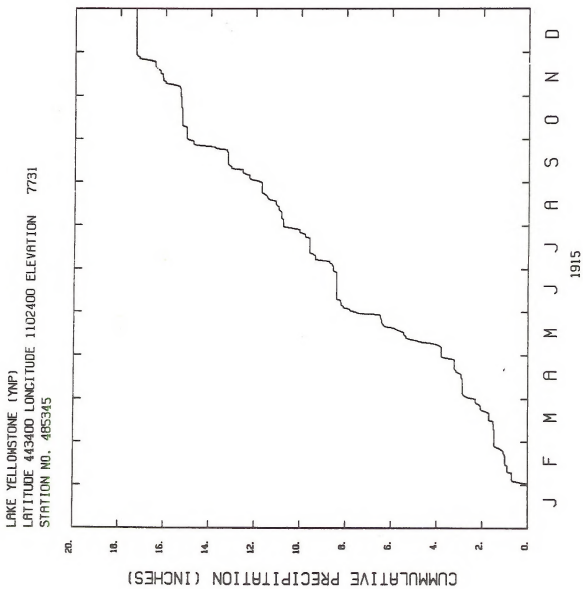
DEGREE

This program prints daily degree day temperatures for a given
station, year and base temperature. The degree day temperature for
a specific day is the maximum plus the minimum divided by two (i.e.
mean daily temperature) minus the given base temperature. The maximum,
minimum and mean for the degree days for each month are printed. The
mean month equals the sum of the degree days for that month divided
by the number of days with available data. The average degree day for
the year, which is the mean annual temperature minus the base tempera-
ture, is also printed. An option is available to not include negative
degree day values (blanks are inserted). In this case the average
degree day for the year is computed using non-negative values only and
monthly summaries are not printed.

DEGREE DAY TABLE FOR 1963 IN DEGREES F.

BASE TEMPERATURE IS 32 DEGREES F.

REDBIRD 1NW (REDBIRD 1941-1970)   STATION NO. 487555

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	-7.0	8.0	4.0	22.5	30.0	32.0	34.0	51.5	36.0	31.5	4.0	.0
2	-2.0	-18.5	-1.0	15.5	17.0	32.5	42.5	43.0	34.5	27.5	11.0	3.0
3	-3.0	1.0	-3.0	1.5	22.5	33.0	47.5	38.5	31.5	34.0	5.5	5.0
4	-3.5	21.0	-5.0	8.5	20.5	34.0	43.0	43.0	31.5	32.0	11.5	6.0
5	-11.5	15.0	-4.5	14.5	26.5	31.0	45.0	44.0	38.5	34.5	14.0	2.5
6	-4.0	10.0	1.0	25.0	33.0	31.5	46.0	46.0	37.5	31.5	12.0	6.5
7	5.0	10.0	4.0	23.5	33.0	33.0	43.5	45.0	39.0	26.0	9.5	4.0
8	5.5	8.0	2.0	24.0	30.5	31.5	46.0	49.5	39.0	25.5	5.0	-14.5
9	.5	4.0	7.5	16.0	39.5	28.0	47.5	45.5	38.0	34.0	9.5	-18.0
10	-21.0	-11.0	3.0	9.0	25.5	31.0	47.5	44.5	36.5	28.5	5.5	-20.5
11	-44.5	-16.5	1.5	10.5	29.0	30.5	42.5	46.5	35.0	26.5	1.5	-28.0
12	-46.5	-10.0	-4.5	14.5	22.5	39.0	41.5	40.0	35.0	31.0	-3.5	-28.5
13	-30.5	-1.5	-4.5	19.5	22.0	38.0	39.0	34.0	37.5	29.5	3.5	-34.5
14	-17.5	-5.5	.5	23.5	25.5	39.5	40.5	40.5	38.0	27.0	8.5	-36.5
15	-25.5	-1.5	7.0	27.5	26.5	31.5	40.0	48.0	27.0	22.0	16.0	-25.5
16	-23.0	.0	5.5	12.5	27.0	32.5	42.0	40.0	41.0	21.5	11.5	-21.0
17	-19.0	-3.5	-8.0	12.5	21.0	30.5	39.0	38.0	38.5	23.0	-2.5	-22.5
18	-33.5	2.0	2.0	11.0	24.0	37.5	45.5	41.5	29.0	23.0	1.5	-21.0
19	-48.5	6.0	5.5	11.0	19.0	36.0	42.5	39.5	34.5	25.0	3.0	-25.0
20	-15.0	-2.0	11.0	8.5	11.5	36.0	46.5	47.0	28.5	24.0	3.5	-16.0
21	6.0	-15.0	13.0	1.5	9.5	43.0	46.5	39.0	26.0	23.0	-12.5	-21.5
22	-18.5	3.5	20.0	1.5	19.5	38.5	48.0	33.0	30.0	28.5	-4.5	-13.0
23	-41.5	1.5	19.5	5.5	27.0	40.0	47.0	40.0	35.5	24.0	2.0	-9.5
24	-32.0	8.5	20.5	11.5	29.0	43.5	47.0	42.5	30.0	26.0	.0	.0
25	-31.0	5.0	12.0	15.5	32.5	39.0	53.0	43.0	28.0	27.5	-.5	1.0
26	-40.0	7.5	7.5	21.0	22.0	37.5	46.5	45.5	31.5	18.0	9.5	3.0
27	-41.5	3.0	17.0	15.5	27.0	41.0	32.0	46.5	33.0	7.0	6.5	-9.0
28	-29.5	8.5	29.0	14.0	28.0	45.5	38.0	37.0	29.5	1.5	.5	-5.5
29	-31.5		19.0	16.5	33.5	39.5	41.0	31.0	25.5	16.0	.5	-3.0
30	-33.5		19.0	21.5	30.0	36.5	42.0	32.5	31.0	16.5	-2.0	-2.0
31	-9.5		20.5		33.0		43.5	33.5		7.0		5.5
DEG.DY.MAX	6.00	21.00	29.00	27.50	35.50	45.50	53.00	51.50	41.00	34.50	16.00	6.50
DEG.DY.MIN	-48.50	-18.50	-8.00	1.50	9.50	28.00	32.00	31.00	24.00	1.50	-12.50	-36.50
MEAN MONTH	-20.87	1.34	7.13	14.50	25.52	35.75	43.35	41.58	33.48	24.27	4.57	-10.92

AVERAGE DEGREE DAY FOR YEAR   16.6

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Example of DEGREE

DOUBLEMASS

This program prints cumulative totals and plots a double mass curve
for precipitation for a given year range. One station is plotted on the
Y-axis and the total for one to ten stations is plotted on the X-axis.
If there are missing data in the given year range, the plot is not
made. Other units that may be used: centimeters.

Example of DOUBLEMASS

ACCUMULATED ANNUAL PRECIPITATION (INCHES) FOR
CASPER 2E (CASPER 1893-1957)
STATION NO. 481565

ACCUMULATED ANNUAL MEAN PRECIPITATION (INCHES)
FOR 2 STATIONS
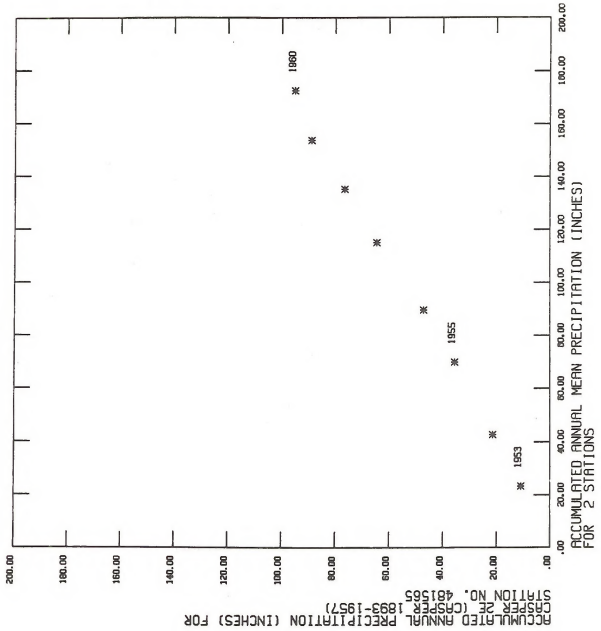
Example of DOUBLEMASS

DOUBLE MASS CURVE FOR PRECIPITATION

SINGLE STATION
 CASPER 2E (CASPER 1893-1957)   STATION NO. 481565

COMBINED STATIONS
 ALVA 5SE (ALVA 1943-1946)   STATION NO. 480200
 BEDFORD 2SE   STATION NO. 480605

ACCUMULATED PRECIPITATION (INCHES)
          SINGLE   COMBINED
   YEAR STATION STATIONS
   1953   11.   23.
   1954   21.   43.
   1955   35.   70.
   1956   47.   89.
   1957   64.   115.
   1958   77.   135.
   1959   89.   154.
   1960   95.   172.

LISTDATAD

This program prints one year of daily climatic data with summaries
for a given parameter and station. The summaries are different for
each parameter. They include monthly and annual maximum, minimum,
mean and total values. Parameters that may be used: mean air tempera-
ture, maximum air temperature, minimum air temperature, precipitation,
snowfall, snowdepth, wind, and evaporation. Other units that may be
used: Celsius, centimeters, miles per hour.

SUNDANCE   STATION NO. 488705

LATITUDE   442400   LONGITUDE 1042100   ELEVATION 4750 FEET

*** MEAN DAILY AIR TEMPERATURES FOR 1970 ***
DEGREES FAHRENHEIT

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	16.5	28.0	23.5	22.5	36.0	48.5	63.0	70.0	74.0	59.0	22.0	33.0
2	13.5	13.0	36.5	32.5	45.0	55.0	63.5	70.5	65.5	55.0	24.5	31.0
3	15.5	22.0	23.0	23.0	47.0	57.0	64.0	66.5	67.0	53.0	25.0	30.5
4	7.0	22.5	24.0	34.0	54.5	57.5	63.5	59.5	68.5	61.0	26.5	34.0
5	-7.5	19.0	24.5	41.5	53.5	61.0	73.0	74.5	72.0	59.0	36.0	21.5
6	0.5	29.5	29.5	48.0	66.0	64.5	71.5	75.0	68.5	53.0	39.5	34.5
7	-2.5	31.0	38.5	51.5	59.5	67.5	69.5	71.5	62.5	53.0	39.0	41.0
8	-5.5	26.5	38.0	34.0	53.0	67.0	71.5	72.0	67.5	28.0	34.0	40.5
9	13.0	31.5	19.5	40.5	43.0	66.0	72.5	69.0	61.0	33.5	37.0	28.5
10	32.0	35.5	14.5	47.5	46.0	69.0	73.5	66.5	50.0	36.0	36.0	14.0
11	29.0	30.0	17.0	44.0	47.0	57.5	74.5	74.5	56.0	39.0	34.5	17.5
12	22.5	30.0	19.5	26.0	49.5	50.5	71.0	73.5	41.5	48.5	36.5	22.5
13	27.0	16.5	16.5	26.0	46.0	54.5	68.0	77.0	30.5	39.5	34.0	17.0
14	31.0	24.0	33.0	28.0	38.0	65.5	67.5	71.0	35.5	34.5	27.0	25.5
15	22.0	33.5	24.5	29.5	44.5	58.5	61.5	61.0	45.0	36.5	34.5	23.0
16	1.0	35.0	29.0	29.0	56.0	59.5	73.0	70.0	49.0	47.0	41.0	26.0
17	-5.5	43.0	32.0	26.5	65.5	59.0	70.5	76.0	55.5	47.0	41.0	26.0
18	6.5	27.5	25.0	27.0	56.0	67.0	71.5	73.5	63.0	46.5	34.5	12.5
19	13.0	25.5	22.5	27.5	55.5	62.5	69.5	67.0	66.5	48.5	26.0	5.0
20	19.5	31.5	18.5	29.0	64.5	60.0	65.5	65.5	64.0	46.0	28.0	13.0
21	25.0	36.0	28.5	32.0	57.0	61.0	72.5	70.5	64.5	40.0	25.0	17.0
22	36.0	33.5	26.0	32.5	52.5	71.0	74.0	66.5	46.5	41.5	25.0	11.5
23	33.5	34.5	32.0	37.0	58.0	73.5	66.0	71.5	55.0	41.5	9.0	9.5
24	38.0	30.5	37.0	41.5	60.0	70.0	64.5	74.5	50.0	50.0	31.5	10.0
25	37.5	27.5	21.5	45.5	49.0	71.5	72.5	72.5	38.5	40.5	34.5	11.0
26	29.0	32.0	21.5	45.5	60.5	70.5	73.0	76.5	42.5	42.5	23.5	18.0
27	33.0	30.5	19.0	44.0	63.5	79.0	70.0	68.0	52.0	24.5	23.5	20.0
28	30.0	19.5	25.5	40.0	57.0	78.0	67.5	67.5	54.5	26.5	28.0	19.5
29	22.0		30.0	32.0	54.0	75.0	70.5	72.5	59.5	31.5	39.0	23.5
30	17.5		24.0	33.5	33.5	63.5	70.0	64.5	60.0	60.0	48.0	23.5
31	24.5		20.5		47.0		67.5	72.5		19.5		29.0
MAX	38.00	43.00	38.50	51.50	66.00	79.00	77.00	77.00	74.00	61.00	48.00	41.00
MIN	-7.50	13.00	14.50	22.50	36.00	48.50	61.50	61.00	30.50	19.50	5.50	5.00
MEAN MONTH	18.47	28.32	25.82	35.03	52.95	63.22	69.50	70.68	55.53	41.29	30.70	22.18

MEAN ANNUAL TEMPERATURE FOR 1970   42.81
MAX TEMPERATURE FOR 1970   96.00   JUN 27
MIN TEMPERATURE FOR 1970   -22.00   JAN 8
MAX MEAN DAILY TEMPERATURE FOR 1970   79.00   JUN 27
MIN MEAN DAILY TEMPERATURE FOR 1970   -7.50   JAN 5

Example of LISTDATAD

SUNDANCE STATICN NO. 488705

LATITUDE 442600 LONGITUDE 1042100 ELEVATION 4750 FEET

*** MINIMUM AIR TEMPERATURES FOR 1970 ***
DEGREES FAHRENHEIT

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	9.	22.	13.	8.	26.	36.	45.	56.	64.	44.	13.	26.
2	9.	-4.	29.	27.	28.	39.	47.	57.	51.	43.	21.	18.
3	11.	8.	10.	11.	28.	45.	50.	53.	54.	36.	22.	21.
4	5.	8.	14.	18.	38.	45.	47.	57.	52.	43.	12.	28.
5	-17.	3.	12.	31.	33.	46.	58.	60.	60.	41.	26.	11.
6	-9.	14.	15.	31.	54.	50.	56.	62.	56.	36.	28.	23.
7	-13.	23.	25.	41.	48.	54.	55.	59.	50.	21.	32.	33.
8	-22.	12.	28.	19.	36.	54.	56.	56.	51.	19.	28.	35.
9	-6.	15.	7.	23.	32.	51.	60.	55.	39.	24.	26.	22.
10	22.	22.	4.	35.	37.	50.	61.	50.	34.	29.	31.	5.
11	14.	15.	7.	33.	37.	41.	61.	61.	44.	26.	26.	5.
12	11.	29.	5.	18.	37.	46.	58.	58.	29.	35.	32.	14.
13	15.	15.	2.	21.	30.	38.	52.	65.	26.	33.	29.	2.
14	22.	15.	24.	20.	31.	45.	53.	56.	32.	28.	23.	17.
15	8.	28.	14.	25.	31.	45.	44.	46.	34.	20.	22.	11.
16	-8.	25.	18.	22.	40.	47.	57.	53.	38.	32.	31.	14.
17	-13.	33.	24.	19.	50.	47.	53.	60.	40.	32.	33.	14.
18	-10.	13.	23.	23.	46.	45.	65.	59.	45.	31.	29.	2.
19	-4.	20.	16.	21.	42.	51.	55.	50.	50.	34.	21.	-9.
20	10.	23.	4.	23.	53.	48.	54.	47.	49.	29.	18.	2.
21	15.	24.	17.	24.	46.	48.	56.	49.	32.	40.	14.	2.
22	30.	15.	18.	23.	49.	54.	60.	53.	31.	27.	-3.	2.
23	19.	21.	22.	25.	45.	60.	51.	55.	40.	29.	-4.	2.
24	29.	13.	32.	27.	50.	53.	47.	62.	36.	33.	17.	4.
25	31.	15.	21.	30.	33.	57.	58.	58.	29.	29.	23.	-4.
26	22.	22.	9.	30.	45.	53.	60.	65.	27.	22.	21.	6.
27	21.	21.	7.	32.	49.	62.	55.	55.	37.	18.	18.	12.
28	17.	15.	16.	31.	48.	61.	60.	54.	37.	24.	11.	10.
29	12.		25.	25.	38.	61.	57.	63.	42.	23.	27.	14.
30	3.		14.	25.	23.	44.	55.	51.	45.	25.	39.	16.
31	13.		11.		38.		53.	58.		5.		20.
MAX	31.00	33.00	32.00	41.00	54.00	62.00	65.00	65.00	64.00	44.00	39.00	35.00
MIN	-22.00	-4.00	2.00	8.00	26.00	36.00	44.00	46.00	26.00	5.00	-4.00	-9.00
MEAN	7.87	16.79	15.74	24.60	40.06	49.50	54.81	56.19	41.80	29.26	22.00	12.45

MAXIMUM FOR YEAR   65.00   SEP.
MINIMUM FOR YEAR -22.00   JAN 8

Example of LISTDATAD

ALBIN   STATION NO. 480080

LATITUDE 412500 LONGITUDE 1040600 ELEVATION 5345 FEET

*** PRECIPITATION (INCHES) FOR 1948 ***

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	.00	.00	T	.08	.05	.00	.05	.00	.00	.00	.00	.00
2	.00	.14	.00	.00	T	.00	.00	.00	.00	.00	.00	.00
3	.00	.00	.21	.00	.00	.15	.00	.45	.00	.00	.00	.00
4	.00	.00	.00	.03	.00	.06	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	.06	T	.00	.00	.05	.00	.00	.10	.09
6	.00	.00	.00	.00	.00	.00	.00	.00	.00	.25	.00	.00
7	.00	.00	.00	.00	T	.00	.00	.00	.22	.00	.24	.00
8	.00	.00	.36	.00	.05	.00	T	.14	.00	.00	.00	.00
9	.30	.00	.00	.00	.00	.00	.00	.06	.00	.00	.00	.00
10	.00	.12	.00	.00	T	.00	.00	.00	.00	.00	.24	.00
11	.00	.06	.00	.00	.00	T	.24	.00	.00	.00	.24	.10
12	T	.06	.00	.00	T	T	T	.00	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	.00	.48	.00	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	.27	.18	.00	.00	.00	.00	.00
15	T	.00	.55	.00	.00	.67	.00	.30	.00	.00	.00	.00
16	.02	.00	.00	.00	.02	.00	.00	.00	.00	.43	.00	.09
17	.09	.00	.00	.00	.00	.00	.00	.00	.00	.00	.10	.00
18	.00	.00	T	.00	T	.00	T	.00	.00	.00	.21	.00
19	.00	.00	.00	.00	.00	.08	.00	.00	.00	.00	.20	.00
20	.00	.00	.10	.00	.00	.04	T	.00	.45	.00	.10	.00
21	.00	.00	.25	.00	.00	.07	.00	.00	.00	.00	.00	.18
22	.30	.00	.30	.00	.00	.31	.00	.00	.00	.00	.18	.48
23	.10	.00	.00	.72	T	.15	.00	.00	.00	.00	.20	.14
24	.30	.00	.30	1.27	.74	T	T	.00	.00	.00	.00	.00
25	.07	.00	T	T	.03	.04	.02	.00	.00	.00	.00	.00
26	.00	.32	.05	.00	.00	.10	.00	.11	.00	.00	.00	.00
27	.00	.00	.00	.00	.07	T	.00	.00	.00	.00	.00	.00
28	.00	T	.00	.00	.14	.00	T	.00	.00	.00	.00	.00
29	.00	T	.00	T	.05	.00	.00	.00	.00	.00	.00	.00
30	.00		.00	T	.03	.00	.00	.00	.00	.00	.00	.00
31	.00		.00		T		.00	.00		.00		.00
TOTAL	.58	.38	1.09	1.46	1.16	1.96	.97	1.41	.67	.68	1.90	1.08

MAXIMUM FOR YEAR   1.27   APR 24
TOTAL FOR YEAR   13.34

T INDICATES TRACE

BATES CREEK   STATION NO. 480550

LATITUDE 423300 LONGITUDE 1061900 ELEVATION 6410 FEET

*** SNOWDEPTH (INCHES) FOR WATER YEAR 1957 ***

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	2.00	.00	3.00	.00	.00	.00	.00	.00	.00	.00
2	.00	1.00	**	.00	3.00	.00	.00	.00	.00	.00	.00	.00
3	.00	12.00	**	.00	3.00	1.00	5.00	.00	.00	.00	.00	.00
4	.00	10.00	**	.00	3.00	2.00	5.00	.00	.00	.00	.00	.00
5	.00	7.00	1.00	.00	2.00	4.00	2.00	.00	.00	.00	.00	.00
6	.00	6.00	4.00	.00		4.00	1.00	.00	.00	.00	.00	.00
7	.00	6.00	3.00	**	**	2.00	1.00	.00	.00	.00	.00	.00
8	.00	5.00	3.00	**	**	2.00	1.00	.00	.00	.00	.00	.00
9	.00	4.00	3.00	1.00	**	**	.00	.00	.00	.00	.00	.00
10	.00	4.00	3.00	1.00		**	.00	.00	.00	.00	.00	.00
11	.00	4.00	**	1.00		.00	3.00	.00	.00	.00	.00	.00
12	.00	3.00	**	1.00		.00	.00	.00	.00	.00	.00	.00
13	.00	3.00	**	2.00		1.00	.00	.00	.00	.00	.00	.00
14	.00	3.00	1.00	2.00		.00	.00	.00	.00	.00	.00	.00
15	.00	4.00	1.00	3.00		.00	.00	.00	.00	.00	.00	.00
16	.00	3.00	**	3.00		.00	.00	.00	.00	.00	.00	.00
17	.00	4.00	**	3.00		.00	.00	.00	.00	.00	.00	.00
18	.00	3.00	**	3.00		.00	.00	.00	.00	.00	.00	.00
19	.00	4.00	**	3.00		.00	.00	.00	.00	.00	.00	.00
20	.00	4.00	**	3.00		.00	.00	.00	.00	.00	.00	.00
21	.00	4.00	**	3.00	2.00	.00	.00	.00	.00	.00	.00	.00
22	.00	4.00	1.00	3.00		2.00	.00	.00	.00	.00	.00	.00
23	.00	3.00	1.00	3.00		4.00	.00	.00	.00	.00	.00	.00
24	**	3.00	1.00	5.00		2.00	.00	.00	.00	.00	.00	.00
25	**	3.00	1.00	5.00		2.00	.00	.00	.00	.00	.00	.00
26	.00	3.00	1.00	5.00		**	.00	.00	.00	.00	.00	.00
27	.00	3.00	1.00	5.00	.00	.00	.00	.00	.00	.00	.00	.00
28	.00	2.00	.00	5.00	.00	.00	.00	.00	.00	.00	.00	.00
29	1.00	2.00	.00	4.00		**	.00	.00	.00	.00	.00	.00
30	.00	2.00	.00	4.00		**	.30	.00	.00	.00	.00	.00
31	.00		3.00			**		.00		.00	.00	
MAX	1.00*	12.00	4.00*	5.00*	3.00*	4.00*	5.00	.00	.00	.00	.00	.00
MIN	.00*	.00*	.00*	.00*	.00*	.00	.00	.00	.00	.00	.00	.00
MEAN	.03*	3.90	1.42*	2.54*	.75*	1.04*	.60	.00	.00	.00	.00	.00

MAXIMUM FOR YEAR 12.00* NOV 3

* INDICATES PARTIAL VALUES
** INDICATES MISSING DATA

Example of LISTDATA3

19

BOYSEN DAM   STATION NO. 481000

LATITUDE 432500 LONGITUDE 1081100 ELEVATION 4642 FEET

*** WIND VELOCITY (MILES) FOR 1960 ***

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	**	**	**	**	**	67.	37.	40.	47.	**	**	**
2	**	**	**	**	**	34.	88.	36.	31.	**	**	**
3	**	**	**	**	41.	43.	61.	50.	23.	**	**	**
4	**	**	**	**	36.	63.	57.	50.	56.	**	**	**
5	**	**	**	**	99.	96.	28.	44.	29.	**	**	**
6	**	**	**	**	25.	58.	28.	78.	30.	**	**	**
7	**	**	**	**	34.	32.	27.	55.	63.	**	**	**
8	**	**	**	**	63.	54.	32.	113.	104.	**	**	**
9	**	**	**	**	55.	44.	29.	39.	30.	**	**	**
10	**	**	**	**	40.	40.	39.	43.	27.	**	**	**
11	**	**	**	**	30.	50.	50.	37.	51.	**	**	**
12	**	**	**	**	28.	51.	47.	40.	38.	**	**	**
13	**	**	**	**	50.	38.	30.	52.	28.	**	**	**
14	**	**	**	**	67.	67.	42.	32.	59.	**	**	**
15	**	**	**	**	34.	64.	39.	49.	55.	**	**	**
16	**	**	**	**	52.	61.	57.	77.	52.	**	**	**
17	**	**	**	**	57.	64.	67.	43.	50.	**	**	**
18	**	**	**	**	90.	42.	32.	25.	21.	**	**	**
19	**	**	**	**	49.	47.	26.	23.	18.	**	**	**
20	**	**	**	**	38.	55.	36.	28.	20.	**	**	**
21	**	**	**	**	61.	91.	38.	28.	96.	**	**	**
22	**	**	**	**	108.	74.	31.	46.	74.	**	**	**
23	**	**	**	**	145.	87.	35.	101.	32.	**	**	**
24	**	**	**	**	59.	32.	46.	32.	40.	**	**	**
25	**	**	**	**	56.	43.	49.	62.	20.	**	**	**
26	**	**	**	**	46.	71.	31.	28.	49.	**	**	**
27	**	**	**	**	32.	57.	5.	28.	25.	**	**	**
28	**	**	**	**	76.	51.	27.	104.	31.	**	**	**
29	**	**	**	**	35.	51.	54.	25.	97.	**	**	**
30	**		**	**	27.	64.	38.	41.	37.	**	**	**
31	**		**		40.		76.	32.		**		**
MAX	***	***	***	***	145.00	96.00	88.00	113.00	104.00	***	***	***
MIN	***	***	***	***	25.00	32.00	5.00	23.00	18.00	***	***	***
MEAN	***	***	***	***	54.24	56.37	41.35	47.65	44.50	***	***	***
TOTAL	***	***	***	***	1573.00	1691.00	1282.00	1477.30	1335.00	***	***	***

MEAN FOR YEAR   48.73*
TOTAL FOR YEAR 7358.00*

* INDICATES PARTIAL VALUES
** INDICATES MISSING DATA
*** INDICATES TOTAL MONTH'S DATA MISSING

Example of LISTDATAD

BOYSEN DAM   STATION NO. 481000

LATITUDE 432500 LONGITUDE 1081100 ELEVATION 4642 FEET

*** EVAPORATION (INCHES) FOR 1970 ***

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	**	**	**	**	**	.17	.31	.30	.19	**	**	**
2	**	**	**	**	**	.27	.32	.40	.24	**	**	**
3	**	**	**	**	**	.30	.43	.30	.20	**	**	**
4	**	**	**	**	**	.30	.30	.32	.30	**	**	**
5	**	**	**	**	**	.25	.35	.35	.30	**	**	**
6	**	**	**	**	.35	.30	.25	.37	.13	**	**	**
7	**	**	**	**	.26	.30	.37	.32	.20	**	**	**
8	**	**	**	**	.08	.40	.35	.34	.40	**	**	**
9	**	**	**	**	.07	.30	.35	.46	.25	**	**	**
10	**	**	**	**	.12	.20	.35	.27	.20	**	**	**
11	**	**	**	**	.16	.14	.25	.33	.17	**	**	**
12	**	**	**	**	.16	.08	.32	.30	.20	**	**	**
13	**	**	**	**	.08	.18	.30	.35	.04	**	**	**
14	**	**	**	**	.30	.24	.43	.55	.04	**	**	**
15	**	**	**	**	.10	.24	.26	.35	.04	**	**	**
16	**	**	**	**	.30	.37	.29	.25	.15	**	**	**
17	**	**	**	**	.37	.20	.24	.40	.20	**	**	**
18	**	**	**	**	.36	.30	.30	.40	.15	**	**	**
19	**	**	**	**	.20	.12	.41	.30	.25	**	**	**
20	**	**	**	**	.25	.25	.25	.31	.20	**	**	**
21	**	**	**	**	.28	.25	.21	.29	.00	**	**	**
22	**	**	**	**	.22	.33	.33	.30	.10	**	**	**
23	**	**	**	**	.19	.22	.36	.50	.02	**	**	**
24	**	**	**	**	.27	.28	.31	.20	.12	**	**	**
25	**	**	**	**	.23	.31	.39	.30	.24	**	**	**
26	**	**	**	**	.28	.30	.29	.28	.02	**	**	**
27	**	**	**	**	.25	.40	.44	.20	.04	**	**	**
28	**	**	**	**	.30	.45	.23	.36	.19	**	**	**
29	**		**	**	.17	.40	.17	.19	.09	**	**	**
30	**		**	**	.23	.30	.30	.18	.27	**	**	**
31	**		**		.25		.20	.23		**		**
MEAN	***	***	***	***		.27	.31	.32	.17	***	***	***
TOTAL	***	***	***	***	6.95E	8.25	9.56	10.00	5.14	***	***	***

TOTAL FOR YEAR   39.90*

* INDICATES PARTIAL VALUES
** INDICATES MISSING DATA
*** INDICATES TOTAL MONTH'S DATA MISSING
E INDICATES ESTIMATED VALUE

Example of LISTDATAD

LISTDATESD

     For every station on file, this program lists a header and the years of data stored for each parameter.

Example of LISTDATESD

HEADERS AND YEARS FOR DAILY CLIMATIC DATA

STATION NO. 248857 WEST YELLOWSTONE (RIVERSIDE 1905-1922)
        MAXIMUM TEMPERATURES
            1905 TO 1909
        MINIMUM TEMPERATURES
            1905 TO 1909
        PRECIPITATION
            1905 TO 1975

STATION NO. 480000 ALBIN
        MAXIMUM TEMPERATURES
            1949 TO 1975
        MINIMUM TEMPERATURES
            1948 TO 1975
        PRECIPITATION
            1941 TO 1975
        SNOWFALL
            1949 TO 1975
        SNOWDEPTH
            1949 TO 1975

STATION NO. 480085 ALCOVA
        MAXIMUM TEMPERATURES
            1899 TO 1906
        MINIMUM TEMPERATURES
            1899 TO 1906
        PRECIPITATION
            1899 TO 1906

STATION NO. 480091 ALCOVA 17NW
        MAXIMUM TEMPERATURES
            1964 TO 1975
        MINIMUM TEMPERATURES
            1964 TO 1975
        PRECIPITATION
            1962 TO 1975
        SNOWFALL
            1963 TO 1975
        SNOWDEPTH
            1963 TO 1975

STATION NO. 480092 ALCOVA 26WNW
        PRECIPITATION
            1956 TO 1960
        SNOWFALL
            1957 TO 1960
        SNOWDEPTH
            1957 TO 1960

MONTHLY

This program lists monthly and annual summaries (either total or
mean values, depending on the type of data) for a specific station,
type of data and year range. It also computes the mean, standard
deviation and sample size for each month separately in the given year
range. Three sets of these statistics are given corresponding to
1) all months with at least some data 2) complete months only (includes
estimated values) and 3) complete years only (includes estimated values).
The annual value for each year is used with the annual mean value for
complete years only (years with estimated values are also used) to
compute the percent of mean for all years that have no missing data.
The maximum daily value and its date of occurrence are given. For
temperatures the minimum daily value and its date are also given.
Parameters that may be used: mean air temperature, precipitation,
snowfall, wind, evaporation. Other units that may be used: centimeters.

Example of MONTHLY

MONTHLY AND ANNUAL SUMMARY

RECLUSE 3NNE (RECLUSE 1930-1935) STATION NO. 487540

LATITUDE 444700 LONGITUDE 1054100 ELEVATION 4200 FEET

*** MEAN MONTHLY AIR TEMPERATURES (F.) ***

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL	PERCENT OF MEAN
1941	24.45	29.46	31.18	49.73	55.10	67.48	73.74	69.74	54.42	44.26	38.93	28.68	45.68	102.63
1942	22.44	21.80	31.87	47.77	49.48	59.27	70.95	69.10	56.97	46.82	32.98	27.40	44.74	100.51
1943	16.74	29.52	24.73	48.58	48.18	58.52	73.00	71.69	59.55	48.68	35.32	26.73	45.10	101.33
1944	22.71	20.62	26.40	42.30	54.60	56.82	66.05	66.74	56.92	51.50	33.08	24.47	43.35	97.39
1945	23.03	23.23	34.03	38.52	50.56	56.05	70.65	69.39	56.03	49.95	32.67	23.03	43.93	98.69
1946	27.52	27.59	37.82	59.02	49.02	60.47	71.61	66.45	56.72	39.97	28.33	23.97	44.96	101.00
1947	19.92	17.86	29.16	42.50	52.10	56.87	72.66	73.31	59.55	52.37	26.43	27.82	44.13	99.14
1948	23.55	19.84	27.55	45.72	54.63	62.80	69.21	70.63	64.07	49.15	29.67	18.82	44.64	100.28
1949	5.02	15.30	30.53*	49.45	55.87	62.57	72.35	73.23	57.87	44.23*	43.42	21.34	44.34*	****
1950	7.92	29.61	27.26	39.83	47.48	60.43	66.31	66.92	56.67	51.77	30.45	29.85	42.86	96.29
1951	18.94	28.29	22.53	38.53	54.74	54.65	59.15	67.29	52.98*	43.63	30.75*	16.39	41.49*	****
1952	20.03	26.33	27.39	46.43	53.69	65.58	67.85	69.44	64.03	48.63	35.35	26.92	45.72	102.72
1953	33.29	26.07	36.13	37.17	47.47	64.38	72.68	70.03*	60.83	52.79	38.38	26.59*	46.90*	****
1954	19.37	36.71	27.76	43.20	51.53	63.72	76.40*	69.23	60.82	53.54	41.67	27.74	46.65*	****
1955	23.26	17.34*	22.77	43.79	54.03	57.79*	71.76	72.10	58.22	49.50*	21.40	21.16	42.76*	****
1956	23.15	21.26	32.11	38.98	54.61	69.08	70.42	67.29	61.55	51.25*	31.13*	28.27	45.76*	****
1957	**	27.73	34.18	39.10	52.77	60.00	71.63*	70.90	57.55	48.04*	30.15	32.82*	47.79*	****
1958	31.43*	25.93	30.58	4C.82	59.13*	50.24*	65.90*	71.94	60.97	51.87*	32.93*	23.81	46.13*	****
1959	24.15	23.77*	36.79	41.75	49.35	66.78	71.71	72.50	59.09*	45.18	28.94*	30.15	45.85*	****
1960	**	**	46.34*	43.82	55.68	64.20	75.69	69.27	60.76*	48.53	35.35	27.27	52.66*	****

ALL MONTHS WITH AT LEAST SOME DATA

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
MEAN	21.32*	24.65*	30.69*	43.65	52.50*	60.83*	70.79*	69.86*	58.78*	48.21*	32.61*	25.66*	45.27*
STDEV	6.48*	5.29*	5.78*	4.04	3.24*	3.77*	2.93*	2.17*	2.90*	3.48*	5.20*	4.04*	2.32*
N	18	19	20	20	20	20	20	20	20	20	20	20	20

COMPLETE MONTHS ONLY

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
MEAN	2?.73	25.13	29.85	43.05	52.15	61.09	70.75	69.85	58.98	47.90	33.03	25.21	44.51
STDEV	6.14	5.28	4.77	4.04	2.92	3.89	2.47	2.23	2.76	3.67	5.72	3.86	.95
N	17	17	18	20	19	18	17	19	17	15	16	18	10

COMPLETE YEARS ONLY

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
MEAN	23.73	24.59	29.52	44.44	51.48	59.73	69.00	69.34	58.49	48.31	31.82	25.77	44.51
STDEV	5.41	4.45	4.23	4.15	2.90	2.93	2.47	2.22	3.30	3.81	3.60	3.25	.95
N	10	10	10	10	10	10	10	10	10	10	10	10	10

MAXIMUM DAILY VALUE   105.00* AUG 7, 1949

MINIMUM DAILY VALUE   -31.00* FEB 13, 1949

* INDICATES PARTIAL VALUES
** INDICATES TOTAL MONTH'S DATA MISSING
**** INDICATES VALUE NOT CALCULATED

MONTHLY AND ANNUAL SUMMARY

CRANDALL CREEK   STATION NO. 482135

LATITUDE 445400 LONGITUDE 1094000 ELEVATION 6600 FEET

*** TOTAL PRECIPITATION (CENTIMETERS) ***

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL	PERCENT OF MEAN
1950	5.05	2.36	4.11	3.49	.69	2.13	7.42	1.63	8.53	1.32	4.04	1.47	42.16	114.70
1951	10.19	2.44	2.49	2.67	5.40	3.76	7.42	3.28	2.29	4.59	.89	3.94	47.24	128.52
1952	3.22	3.81	1.04	1.30	2.87	1.73	3.28	5.21	.58	.00	.41	2.77	26.01	70.76
1953	6.35	4.01	1.85	3.99	3.43	1.02	1.09	4.62	1.70	1.09	2.77	2.21	33.93	92.32
1954	5.56	1.37	5.00	4.90	.76	4.11	2.29	2.39	1.73	1.96	.48	2.72	33.27	90.52
1955	.69	3.61	2.31	2.39	1.83	2.44	1.65	1.35	2.13	.00	2.72	5.66	26.77	72.83
1956	5.05	1.70	7.92	3.99	2.54	2.01	2.36	2.29	1.98	2.57	4.09	5.11	41.61	113.18
1957	3.71	8.92	3.10	3.02	3.07*	8.97	.56	1.65	2.59	5.45	.69	3.61	45.14*	****
1958	2.82	2.39	1.93	2.41	3.96	6.78	4.95	2.41	2.29	.69	3.33	.89	34.85	94.80
1959	2.74	6.40	2.13	1.50	6.02	1.02	3.56	1.24	2.13	7.87	2.11	.30	37.03	100.75
1960	1.52	2.72	5.21	2.77	.13	1.78	1.19	4.83	.94	2.90	1.83	.41	26.21	71.31
1961	.03	1.52	1.98	7.31	7.24	1.37	4.85	3.86	6.68	2.47	2.01	2.11	36.42	99.09
1962	3.61	3.89	1.98	.25	4.65	7.01	3.78	5.64	6.45	3.35	.81	.25	41.68	113.39
1963	5.51	2.97	.53	10.06	5.23	3.91	1.65	.20	.00	.00	3.58		33.65*	****
1964	8.43	1.17	1.98	4.06	4.42	3.09	1.14	.56	1.73	3.42	2.31	6.35	39.45	107.31
1965	5.09	.89	3.43	5.84	3.78	4.39	3.43	3.53	4.27	.00	.63	1.19	36.47	99.23
1966	1.14	1.78	2.16	3.30	3.48	4.93	.97	4.17	5.21	1.75	3.81	4.06	36.75	99.99
1967	4.84	1.78	2.79	3.92	4.62	8.15	2.92	1.65	.84	6.76	2.46	3.43	43.00	116.98
1968	3.23	1.65	1.80	.66	5.08	7.24	1.27	8.13	3.10	1.96	3.33	3.56	41.00	111.53
1969	3.56	2.34	1.09	1.75	3.78	7.42	1.47	.25	2.69	2.26	1.68	2.03	30.33	82.50
1970	7.37	1.55	1.98	5.11	3.91	3.76	2.21	3.30	6.83	1.02	4.62	2.57	44.22	120.30

ALL MONTHS WITH AT LEAST SOME DATA

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
MEAN	4.26	2.82	2.71	3.27	3.57*	4.18	2.83	2.94	3.23*	2.44	2.13	2.77	37.01*
STDEV	2.53	1.89	1.68	2.11	1.74*	2.51	1.97	2.01	2.29*	2.20	1.38	1.72	6.23*
N	21	21	21	21	21	21	21	21	20	21	21	21	21

COMPLETE MONTHS ONLY

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
MEAN	4.26	2.82	2.71	3.27	3.59	4.18	2.83	2.94	3.23	2.44	2.13	2.77	36.76
STDEV	2.53	1.89	1.69	2.11	1.79	2.51	1.97	2.01	2.29	2.20	1.38	1.72	6.23
N	21	21	21	21	20	21	21	21	20	21	21	21	19

COMPLETE YEARS ONLY

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
MEAN	4.23	2.49	2.80	2.93	3.51	3.94	3.01	3.16	3.27	2.41	2.32	2.69	36.76
STDEV	2.65	1.34	1.69	1.50	1.79	2.38	1.98	1.97	2.35	2.13	1.31	1.73	6.23
N	19	19	19	19	19	19	19	19	19	19	19	19	19
PERCENT OF ANNUAL	11.5	6.8	7.6	8.0	9.5	10.7	8.2	8.6	8.9	6.6	6.3	7.3	100.0

MAXIMUM DAILY VALUE   4.32* OCT 15, 1957

* INDICATES PARTIAL VALUES
** INDICATES TOTAL MONTH'S DATA MISSING
**** INDICATES VALUE NOT CALCULATED

Example of MONTHLY

NORMALTEMP

This program computes and prints normal temperatures for a given
station. The year range used is 1941 to 1970. The maximum and minimum
normal temperature values for each month are printed along with the
normal monthly temperatures. If there are no missing data, the normal
annual temperature is printed.

NORMAL MEAN DAILY TEMPERATURE 1941-1970

AFTON (GROVER 1903-1946) (GROVER 2S 1946-1957) (AFTON 2N 1957-1963)   STATION NO. 484095

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	13.0	16.5	21.3	33.6*	41.3*	49.7	56.9	62.6	56.1	47.5	33.4*	21.0*
2	13.0	15.4	22.1	33.0*	43.4*	50.8	57.3	62.5	56.3	47.1	32.9*	22.7*
3	8.9	17.3	20.7	31.9*	44.1*	51.2	58.7	62.3	55.6	46.2	33.2*	24.6*
4	8.2	18.3	21.1	32.3*	45.7*	51.2	57.7	61.7	55.5	46.9	34.9*	22.4*
5	12.7	17.0	18.2	34.0*	46.3*	52.2	58.4	61.9	56.3	46.2	32.7*	22.3*
6	14.1	19.1	19.9	34.1*	46.1*	51.9	58.7	60.2	55.5	45.2	32.4*	21.2*
7	15.3	19.1	21.8	32.3*	47.7*	52.3	59.1	61.1	56.3	45.3	32.2*	19.2*
8	14.2	17.9	23.3	33.0*	46.2*	51.3	59.5	61.8	55.7	45.4	31.1*	17.4*
9	12.4	18.9	25.4	34.5*	47.1*	52.8	60.1	60.9	54.1	45.4	29.7*	14.6*
10	12.3	19.8	23.2	34.7*	46.6*	52.2	60.3	60.3	53.7	44.4	31.6*	15.6*
11	14.0	20.3	21.0	34.2*	45.7*	52.6	59.6	60.6	54.1	45.3	32.6*	17.7*
12	12.9	20.5	21.2	35.1*	45.8*	52.4	60.2	60.7	52.9	45.0	31.6*	17.2*
13	14.2	18.8	23.9	36.3*	46.7*	52.6	60.6	59.6	52.9	44.0	30.7*	17.3*
14	16.8	18.9	23.9	37.1*	46.6*	53.0	61.0	59.2	52.4	42.8	29.8*	15.6*
15	18.0	17.8	22.9	36.7*	45.8*	52.2	61.5	59.2	51.3	42.1	28.6*	15.6*
16	16.0	20.6	22.9	37.5*	47.6*	53.3	61.1	59.6	50.4	42.7	24.3*	16.2*
17	13.5	21.4	26.3	38.3*	48.3*	52.9	61.8	59.6	49.5	41.6	24.6*	15.8*
18	12.9	20.3	24.7	37.6*	47.7*	54.7	62.3	59.5	49.7	41.6	25.4*	15.1*
19	12.3	17.5	24.8	39.3*	49.3*	55.9	62.7	59.3	50.8	41.9	25.0*	17.5*
20	14.6	18.5	24.1	39.0*	49.8*	55.2	62.3	58.7	49.3	41.7	26.0*	18.2*
21	13.5	20.0	24.5	39.9*	49.4*	54.8	62.2	58.0	48.6	41.0	25.2*	20.8*
22	14.8	23.3	27.4	40.8*	49.2*	55.3	61.8	58.0	47.4	39.0	21.2*	19.9*
23	18.3	22.4	29.1	39.4*	49.1*	55.5	63.4	58.5	49.0	39.5	24.5*	18.1*
24	19.7	20.5	29.3	39.7*	49.0*	55.5	62.4	58.5	48.8	39.2	26.6*	16.8*
25	19.4	20.3	27.8	39.9*	50.4*	55.1	61.8	57.8	49.5	39.2	26.1*	14.8*
26	18.7	18.6	28.7	39.7*	51.3*	55.2	62.2	58.7	50.4	39.5	24.9*	14.7*
27	16.4	17.9	28.1	39.2*	50.8*	54.7	62.4	57.3	49.8	38.0	23.9*	14.6*
28	14.6	18.2	28.3	41.5*	50.5*	54.3	61.9	57.0	49.1	37.3	22.0*	14.8*
29	12.9		30.6	41.4*	49.6*	54.5	61.8	56.5	48.6	36.4	20.0*	14.8*
30	13.1		31.3	40.6*	49.0*	55.1	61.6	54.9	48.0	37.0	22.4*	14.0*
31	13.9		31.6		50.1*		62.4	56.0		35.4		12.2*
MAX	19.68	23.30	31.60	41.47*	51.29*	55.87	63.37	62.62	56.27	47.52	34.91*	24.59*
MIN	8.18	15.42	18.20	31.90*	41.29*	49.72	58.90	54.87	47.45	35.37	20.02*	12.24*
NORM. MONTH	14.34	19.12	24.83	36.90*	47.68*	53.35	60.76	59.42	51.93	42.25	28.01*	17.50*

NORMAL ANNUAL TEMPERATURE   38.07*

* INDICATES ENCOUNTERED MISSING DATA

Example of NORMALTEMP

OCCUR

This program calculates, prints and plots the number of precipitation occurrences in each class of eighteen class sizes for a given station and year range. The class sizes are as follows: for inches 0., .1, .2, .3, .4, .5, .6, .7, .8, .9, 1., 1.2, 1.4, 1.6, 1.8, 2., 2.5, 3.; for centimeters 0., .2, .5, .8, 1., 1.3, 1.5, 1.8, 2., 2.3, 2.5, 3., 3.6, 4.1, 4.6, 5.1, 6.4, 7.6. The printout is tabulated by year. The plot uses the total of all years in the given year range. If a year contains missing data that year is not used in the calculations. Other units that may be used: centimeters.

BEDFORD 2SE
STATION NO. 480605

NUMBER OF PRECIPITATION OCCURRENCES
FOR YEARS 1953 TO 1960

AMOUNT (IN INCHES)
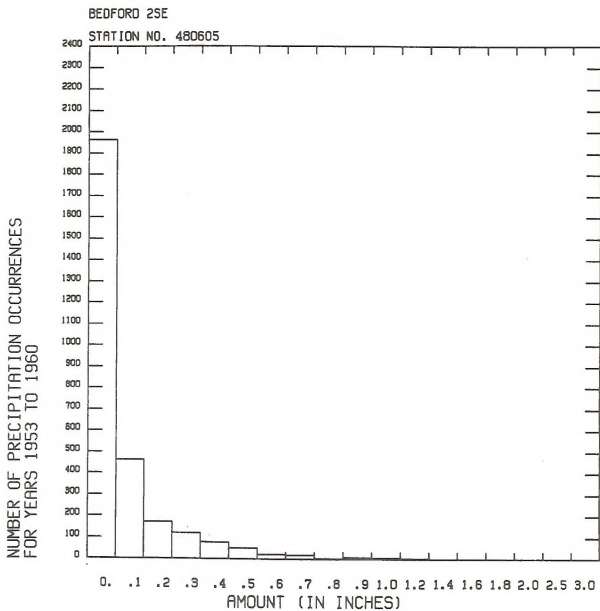
BEDFORD 2SE   STATION NO. 480605

NUMBER OF PRECIPITATION OCCURRENCES (IN INCHES)

YEAR	0.	.1	.2	.3	.4	.5	.6	.7	.8	.9	1.0	1.2	1.4	1.6	1.8	2.0	2.5	3.0
1953	247	58	22	13	7	6	7	2	0	2	0	0	0	1	0	0	0	0
1954	259	41	23	12	17	5	3	2	1	1	0	0	1	0	0	0	0	0
1955	234	61	25	17	11	6	1	5	0	1	3	1	0	0	0	0	0	0
1956	249	65	16	16	6	7	1	2	1	2	1	0	0	0	0	0	0	0
1957	221	73	19	20	14	9	3	3	0	0	1	1	1	0	0	0	0	0
1958	254	51	20	20	6	3	4	1	2	1	1	1	0	1	0	0	0	0
1959	252	53	28	12	6	8	2	2	0	1	1	0	0	0	0	0	0	0
1960	247	61	20	12	11	8	2	3	1	1	0	0	0	0	0	0	0	0
TOTAL	1963	463	173	122	78	52	23	20	5	9	7	3	2	2	0	0	0	0

VALUE FOR SPECIFIC CLASS SIZE INDICATES NUMBER OF PRECIPITATION OCCURRENCES FOR THAT CLASS SIZE OR LESS THAN THAT CLASS SIZE BUT GREATER THAN THE NEXT SMALLER CLASS SIZE.
THAT IS, CLASS SIZE N IS USED FOR VALUES LESS THAN OR EQUAL TO N AND GREATER THAN N-1

Example of OCCUR

PARGREATER

This program tabulates the number of days a type of data was greater than or less than (depending on the option) specified values (up to eleven). Each year is treated separately. The mean for each specified value for the year range is printed. If a year contains missing data, that year is not used. The user specifies up to eleven values and one of the following options:

1. greater than or equal to
2. less than
3. greater than
4. less than or equal to

In the following example, precipitation was used with the greater than option. Parameters that may be used: maximum air temperature, minimum air temperature and precipitation. Other units that may be used: centimeters.

LAKE YELLOWSTONE (YNP)   STATION NO. 485345
NUMBER OF DAYS PRECIPITATION
WAS
GREATER THAN SPECIFIED INCHES

YEAR	.0	.1	.2	.3	.4	.5	.6	.7	.8	.9	1.0
1924	66	50	25	16	10	5	3	2	1	0	0
1928	92	53	27	11	6	2	2	2	2	1	1
1929	88	53	28	15	11	7	5	4	2	1	1
1933	83	38	15	7	3	1	1	0	0	0	0
1934	104	54	26	13	6	6	3	2	1	0	0
1937	47	28	16	12	6	2	2	1	1	0	0
1941	112	49	22	14	6	3	2	2	1	0	0
1942	103	31	11	6	3	2	1	0	0	0	0
1947	64	34	16	11	8	5	4	2	1	1	1
1949	152	68	31	15	5	3	2	1	1	1	1
1952	125	61	19	12	10	5	4	3	1	1	1
1955	184	74	40	19	11	7	5	4	2	2	1
1956	141	58	28	11	4	2	1	1	1	1	0
1960	144	50	24	14	9	9	4	2	1	1	0
1963	146	68	37	19	9	6	3	2	1	0	0
1966	127	40	27	16	11	9	4	4	3	2	2
1967	190	69	38	20	13	8	2	2	0	0	0
1968	159	57	39	22	11	5	4	3	1	1	1
1970	183	87	43	27	8	4	0	0	0	0	0
1972	151	64	28	13	7	5	3	2	1	0	0
1974	132	52	22	10	8	4	1	1	1	0	0

MEAN 123.48 54.19 26.76 14.43 7.86 4.76 2.67 1.90 1.05 .57 .43

Example of PARGREATER

PLOTDAYD

    This program plots daily climatic values for a specific station, parameter and year range. Each year is plotted on a separate graph. Blank spaces indicate missing data. Parameters that may be used: mean air temperature (includes maximum and minimum), precipitation, snowfall, snowdepth, wind and evaporation.
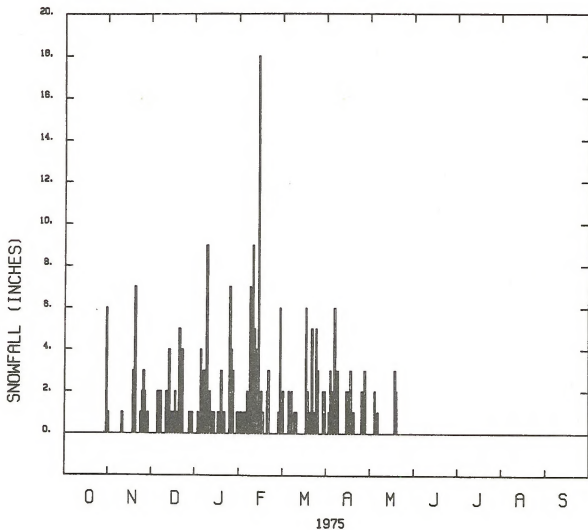
RECLUSE 3NNE (RECLUSE 1930-1935)
LATITUDE 444700 LONGITUDE 1054100 ELEVATION   4200
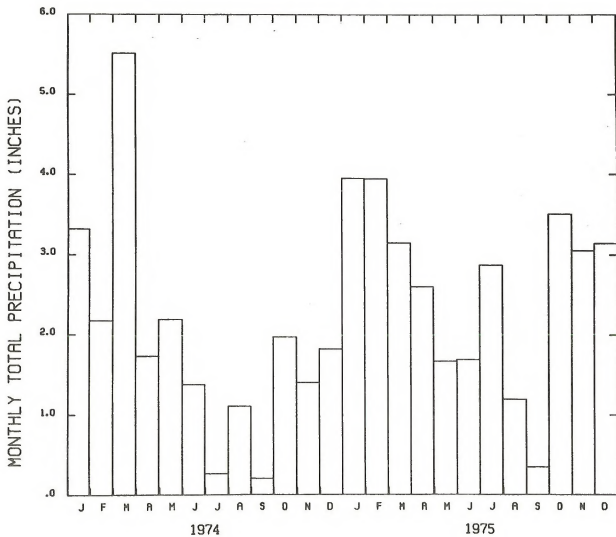STATION NO. 487540
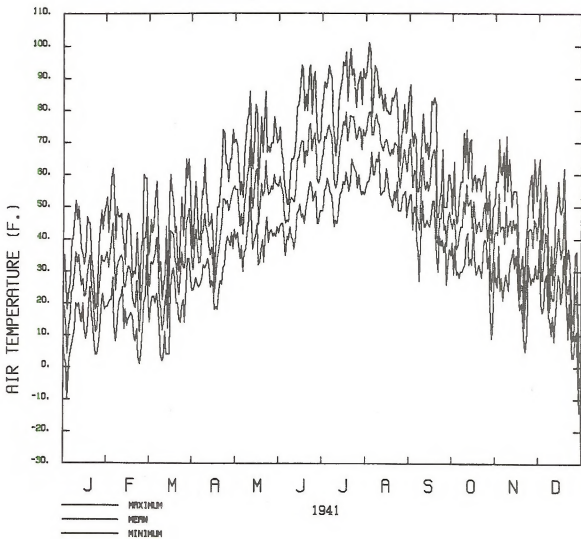
Example of PLOTDAYD

MORAN 5WNW (MORAN 1911-1961)
LATITUDE 435100 LONGITUDE 1103500 ELEVATION   6798
STATION NO. 486440

SNOWFALL (INCHES)

1975

38

PLOTMONTH

This program plots monthly mean or total values as a bar graph.
Up to twenty-four years may be plotted on one graph. If a month
contains missing data, an asterisk (*) is printed below the month. If
the month is an estimated value, an E is printed below the month.
Mean monthly values for a given year range can optionally be plotted on
the same graph. These will be plotted with a dashed line. No symbols
are printed for missing or estimated data that correspond to these
values. Parameters that may be used: mean air temperature,
precipitation, snowfall, wind and evaporation.

MORAN 5WNW (MORAN 1911-1961)
STATION NO. 486440

Example of PLOTMONTH

40

CASPER 2E (CASPER 1893-1957)
STATION NO. 481565

Example of PLOTMONTH
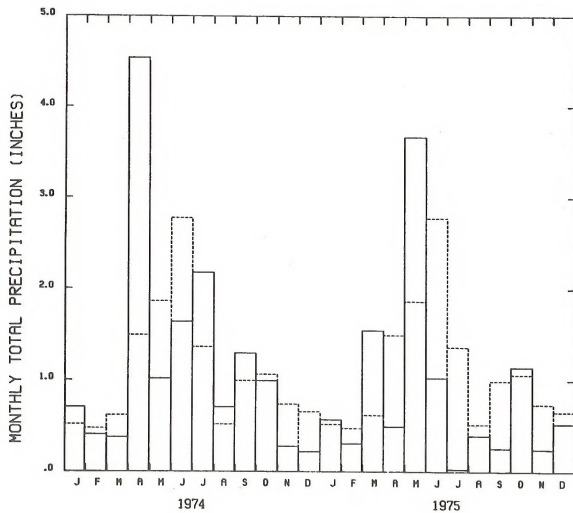
------- MEAN MONTHLY VALUE FOR 1965 TO 1970

PLOTYEAR

This program plots annual daily climatic values given a specific
station, parameter and year range. If the year contains missing values,
an asterisk (*) is printed below that year. If the annual value is
estimated, an E is printed below that year. Parameters that may be
used: mean air temperature, precipitation, snowfall, wind and
evaporation (only summer months, June - September, are used for
evaporation).

ANNUAL TOTAL PRECIPITATION (INCHES)

Example of PLOTYEAR
MORAN 5WNW (MORAN 1911-1961)
STATION NO. 486440

YEAR

43
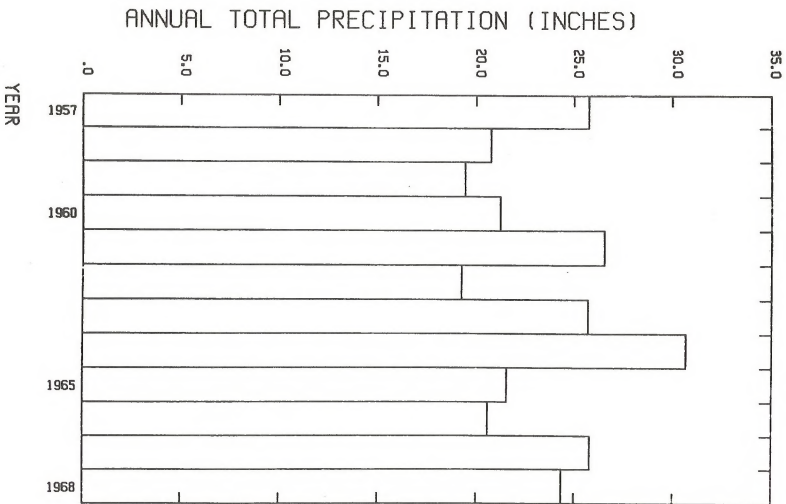
PLRUNOFF

This program plots monthly runoff, and optionally, monthly precipitation for a specified station on the same graph against time. If the month contains missing data a symbol is printed below that month, an asterisk (*) for runoff and a triangle (Δ) for precipitation. Data are plotted by water year.

LITTLE LARAMIE RIVER NEAR FILMORE (HATTON), WYOMING   STATION NO 066610.00

CENTENNIAL
STATION NUMBER 481610

Example of PLRUNOFF

45
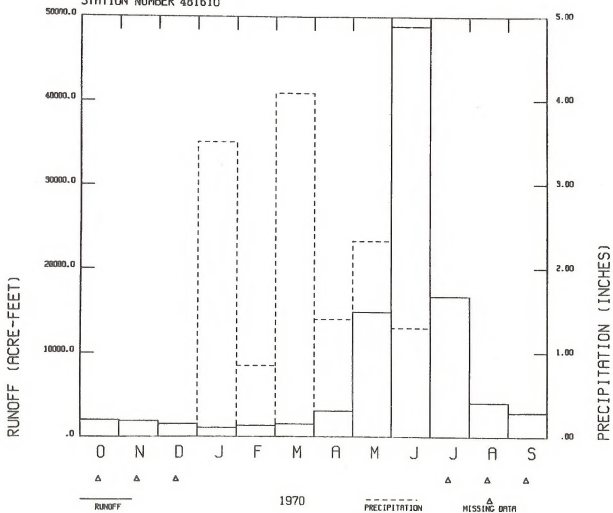
RUN

     This program calculates, prints and plots the running average of total annual precipitation for a given set of stations and year range. Up to ten stations may be used. If an entire year is missing, the running averages that would have used that year are not calculated nor plotted. An asterisk (*) is placed after a value if missing data was encountered while calculating that value. When an estimated value is encountered an E is printed after the corresponding years. Other units that may be used: centimeters.

STATION NUMBERS
480605 485345 484095 485410 484910 488315
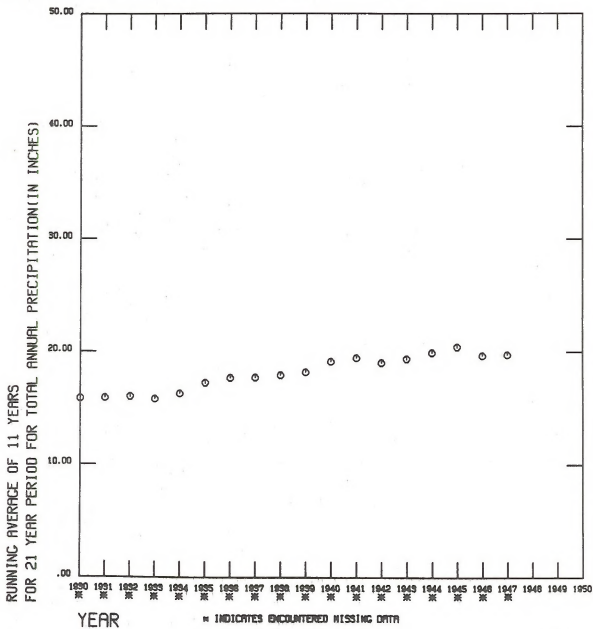
RUNNING AVERAGE OF 11 YEARS
FOR 21 YEAR PERIOD FOR TOTAL ANNUAL PRECIPITATION(IN INCHES)

YEAR   ⋈ INDICATES ENCOUNTERED MISSING DATA

```
RUNNING AVERAGE OF 11 YEARS
FOR 21 YEAR PERIOD FOR TOTAL ANNUAL PRECIPITATION
IN INCHES
BEDFORD 2SE    STATION NO. 480605
LAKE YELLOWSTONE (YNP)     STATION NO. 485345
AFTON (GROVER 1903-1946) (GROVER 2S 1946-1957) (AFTON 2N 1957-1963)    STATION NO. 484095
LARAMIE   STATION NO. 485410
JACKSON   STATION NO. 484910
SNAKE RIVER (YNP)     STATION NO. 488315

     1930          15.8*
     1931          15.9*
     1932          16.0*
     1933          15.8*
     1934          16.2*
     1935          17.2*
     1936          17.6*
     1937          17.6*
     1938          17.9*
     1939          18.1*
     1940          19.1*
     1941          19.4*
     1942          19.0*
     1943          19.4*
     1944          19.9*
     1945          20.4*
     1946          19.6*
     1947          19.7*
     1948           **
     1949           **
     1950           **

   *  INDICATES ENCOUNTERED MISSING DATA
   ** INDICATES ENTIRE YEAR MISSING FOR COMPUTATION
```

SNOWGREATER

This program prints the following for each year for a given station, year range (water year) and specified depth:

number of days snowfall greater than or equal to specified depth in inches,

first snowfall greater than or equal to specified depth in inches (prints date),

last snowfall greater than or equal to specified depth in inches (prints date),

depth in inches of snow on first of December, January, February and March.

The following summary is printed for the given year range:

average number of days per year snowfall was greater than or equal to specified depth in inches,

average depth on December 1,

average depth on January 1,

average depth on February 1,

average depth on March 1.

If snowfall data for a specific year are missing or accumulated in the next day for one or more days, that year is not printed. Other units that may be used: centimeters.

WATER YEAR	NUMBER OF DAYS SNOWFALL GREATER THAN OR EQUAL TO .5 INCH	FIRST SNOWFALL GREATER THAN OR EQUAL TO .5 INCH	LAST SNOWFALL GREATER THAN OR EQUAL TO .5 INCH	DEPTH IN INCHES OF SNOW ON FIRST DAY OF DEC	JAN	FEB	MAR
1950	20						
1954	11	OCT 19	MAY 7	.00	.00	.00	.00
1959	17	NOV 20	MAY 2	.00	.00	.00	.00
1960	13	NOV 16	APR 19	.00	.00	.00	.00
1961	15	OCT 1	MAY 5	.00	.00	3.00	3.00
1962	14	NOV 4	APR 11	.00	2.00	.00	.00
1964	7	OCT 29	APR 7	.00	.00	.00	1.00
1965	15	DEC 10	APR 12	.00	.00	.00	.00
		NOV 20	SEP 18	.00	.00	.00	.00

```
AVERAGE NUMBER OF DAYS PER YEAR SNOWFALL WAS GREATER THAN OR EQUAL TO  .5 INCH    14.00
AVERAGE DEPTH ON DECEMBER 1     .00
AVERAGE DEPTH ON JANUARY 1      .25
AVERAGE DEPTH ON FEBRUARY 1     .38
AVERAGE DEPTH ON MARCH 1        .50
```

Example of SNOWGREATER

TEMPBELOW

This program works with minimum air temperature and a specified degree (DEG) in Fahrenheit. It lists for each year:

    number of days temperature below DEG,
    last day before August 1 below DEG,
    first day after August 1 below DEG,
    number of days between last day and first day (last day and first
        day not counted).

The program also calculates the mean for all years for "number of days temperature below DEG" and "number of days between last day and first day."

KEMMERER 4SW (DIAMONDVILLE 1902) (KEMMERER 1902-1969)   STATION NO. 485105

YEAR	NUMBER OF DAYS MINIMUM AIR TEMPERATURE BELOW 32.0 DEGREES F.	LAST DAY BEFORE AUGUST 1 BELOW 32.0 DEGREES F.	FIRST DAY AFTER AUGUST 1 BELOW 32.0 DEGREES F.	NUMBER OF DAYS BETWEEN LAST DAY AND FIRST DAY
1941	222	MAY 20	AUG 31	102
1942	226	JUN 27	SEP 14	78
1943	213	JUL 13	AUG 31	48
1944	224	JUN 18	AUG 15	57
1945	244	JUL 1	SEP 8	68
1946	240	JUN 25	SEP 9	75
1947	226	JUL 1	AUG 23	52
1962	212	JUN 8	AUG 23	75
1963	204	JUN 30	OCT 10	101
1965	237	MAY 28	AUG 30	93
1966	245	JUN 25	AUG 21	56
1967	220	MAY 20	SEP 13	115
1968	247	JUL 1	AUG 16	45
1969	218	JUN 30	SEP 23	84
1970	236	MAY 31	SEP 10	101
1974	239	JUN 10	AUG 21	71
MEAN	228.31			76.31

Example of TEMPBELOW

PROGRAMS FOR HOURLY PRECIPITATION DATA

All of the programs can be run given a specific station number.
Some of the hourly precipitation programs can be run given specific
location information. This location information can be either a county
or a range of latitudes and longitudes. A date range (month and year)
may also be given. The following types of results may be produced:

    plot of hourly precipitation data (PLOTHOURP),
    list of stations and dates (LISTDATESP),
    list of stations and data by month (LISTDATAP),
    list of stations.

DAILYPRINTP

This program prints daily precipitation values calculated from
hourly precipitation values. Other units that may be used: centimeters.

MULE CREEK (MOVED 2 MILES IN 1972)   STATION NUMBER 486600

LATITUDE 43-21 LONGITUDE 104- 7 ELEVATION 4120   NIOBRARA COUNTY

*** PRECIPITATION (INCHES) FOR 1971 ***
DAILY VALUES COMPUTED FROM HOURLY VALUES

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AJG	SEP	OCT	NOV	DEC
1	.00	.06	.00	.00	.00	.00	.00*	.00	.00	.38	.00	.00
2	.00	.01	.00	.00	.00	.00	**	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	**	.00	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	.46	**	.00	1.00	.00	.00	.00
5	.00	.03	.20	.00	.39	.00	**	.00	.00	.00	.05	.00
6	.00	.00	.02	.00	.00	.05	**	.00	.09	.00	.00	.00
7	.00	.00	.00	.03	.00	.00	**	.00	.22	.00	.00	.05
8	.00	.00	.00	.00	.06	.00	**	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	.21	.05	**	.42	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	**	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	.00	**	.30	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.10	**	.00	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	.00	**	.00	.00	.00	.05	.00
14	.00	.00	.00	.00	.00	.00	**	.00	.00	.00	.00	.00
15	.00	.10	.05	.00	.00	.00	**	.00	.00	.00	.21	.10
16	.00	.00	.00	.00	.08	.00	**	.00	.00	.22	.52	.00
17	.00	.03	.06	.00	.00	.70	**	.12	.00	.08	.05	.00
18	.00	.05	.00	1.99	.00	.00	**	.16	.00	.00	.00	.00
19	.00	.00	.00	.42	.00	.00	**	.06	.00	.00	.00	.00
20	.03	.00	.00	.00	.00	.00	**	.30	.00	.00	.00	.00
21	.00	.00	NEXT	.20	.90	.00	.00*	.00	.00	.00	.00	.00
22	.00	.00	.15	.00	2.81	.00	.00	.00	.00	.00	NEXT	.00
23	.00	.00	.00	.07	1.51	.00	.00	.00	.00	.00	.05	.00
24	.00	.00	.00	.43	.00	.00	.00	.03	.00	.00	.00	.00
25	.00	.09	.00	.40	.30	.00	.00	.00	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	.00	.00	.00	.82	.53	.00	.00
27	.00	.00	.00	.00	.00	.00	.00	.00	.00	.17	.00	.00
28	.00	.00	.00	.00	.05	.00	.00	.00	.00	.00	.00	.00
29	.00		.00	.00	.35	.06	.00	.00	.00	.00	.03	.00
30	.00		.00	.00	.05	.57	.00	.00	.00	.00	.00	.00
31	.09		.00		.00		.00	.00		.00		
TOTAL	.12	.48	.43	3.51	6.21	1.63	.00*	.76	2.18	1.38	.93	.15

MAXIMUM FOR YEAR   2.81* MAY 22
TOTAL FOR YEAR   17.78*

* INDICATES PARTIAL VALUES
** INDICATES MISSING DATA
NEXT INDICATES TOTAL IN SUBSEQUENT
HOUR OR DAY

Example of DAILYPRINTP

57

LISTDATAP

This program lists hourly precipitation data by month. The following are also printed: daily total, monthly total, maximum amount in one day (day is also given), maximum amount in one hour (day and hour of month are also given) and number of events in month. Other units that may be used: centimeters.

MONETA 21SSE   STATION NUMBER 486382

LATITUDE 42-52 LONGITUDE 107-30 ELEVATION 6139   FREMONT COUNTY

*** HOURLY PRECIPITATION (INCHES) FOR JULY   1954 ***

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	DAILY TOTAL
1	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.14	.07	.00	.00	.00	.21
16	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.40	.01	.41
20	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.08	.01	.00	.00	.00	.00	.00	.00	.00	.09
22	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
25	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
27	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
28	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
29	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
30	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
31	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00

MONTHLY TOTAL = .71
MAXIMUM AMOUNT IN ONE DAY = .41   DAY = 19
MAXIMUM AMOUNT IN ONE HOUR = .40   DAY = 19   HOUR OF MONTH = 455
NUMBER OF EVENTS IN MONTH = 6

59

Example of LISTDATAP

LISTDATESP

This program lists the years of data available for hourly precipitation. It lists headers, station numbers and location data along with year and quarter year ranges. For example 1977 1 specifies the first quarter (January, February and March) of 1977. The total number of headers and the number of data records on file are also listed.

HEADERS AND DATES FOR HOURLY PRECIPITATION

ALADDIN   STATION NUMBER 480050
LATITUDE 44-38 LONGITUDE 104-11 ELEVATION 3740   CROOK COUNTY
     1951 2 - 1951 4
ALADDIN 6S   STATION NUMBER 480056
LATITUDE 44-33 LONGITUDE 104-12 ELEVATION 3845   CROOK COUNTY
     1952 2 - 1952 2
ANTELOPE SPRINGS STATION NUMBER 480237
LATITUDE 43-26 LONGITUDE 106-35 ELEVATION 5175   NATRONA COUNTY
     1950 3 - 1950 3
ARAPAHOE RANCH   STATION NUMBER 480250
LATITUDE 43-43 LONGITUDE 108-32 ELEVATION 5205   HOT SPRINGS COUNTY
     1948 3 - 1948 4
     1949 2 - 1950 2
BADWATER 2N (BADWATER 1940-1955) STATION NUMBER 480470
LATITUDE 43-21 LONGITUDE 107-25 ELEVATION 6362   NATRONA COUNTY
     1948 3 - 1960 1
BARNUM 1N (BARNUM 1905-1938) (MOVED 3 MILES IN 1923) STATION NUMBER 480528
LATITUDE 43-42 LONGITUDE 106-55 ELEVATION 5145   JOHNSON COUNTY
     1949 4 - 1958 2
BASIN   STATION NUMBER 480540
LATITUDE 44-23 LONGITUDE 108- 3 ELEVATION 3837   BIG HORN COUNTY
     1949 3 - 1958 2
BEULAH 8WSW STATION NUMBER 480640
LATITUDE 44-31 LONGITUDE 104-16 ELEVATION 4170   CROOK COUNTY
     1952 3 - 1958 2

PLOTDAYP

This program plots daily precipitation values calculated from hourly values. Each year is plotted on a separate graph.

BIG PINEY
LATITUDE   4232 LONGITUDE   11007 ELEVATION   6821
STATION NO. 480695

PRECIPITATION (INCHES)

J F M A M J J A S O N D

1973

Example of PLOTDAYP
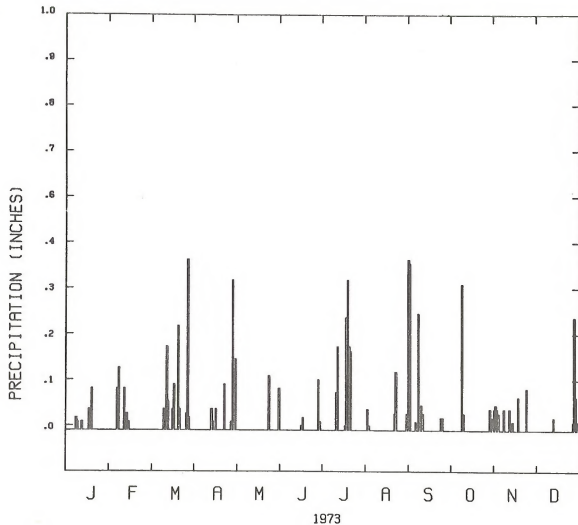
PLOTHOURP

This program plots hourly precipitation by month against time for a given station and month and year range. Missing values are indicated by blanks on the graph.

CRESTON (MOVED 2 MILES IN 1961)
LATITUDE 4144 LONGITUDE 10744 ELEVATION   7040
STATION NUMBER 482175

HOURLY PRECIPITATION (INCHES)

DAY OF MONTH
APRIL   1974
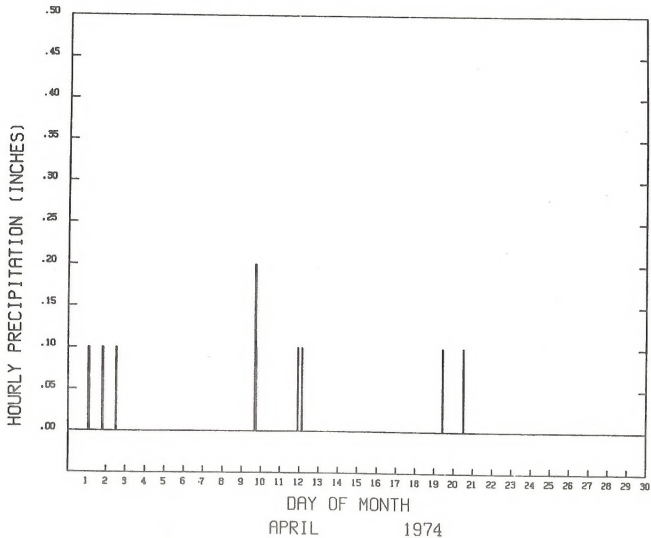
STORM

This program tabulates hourly precipitation data by storm occurrence given a specific station and year range. For each storm it prints beginning date, beginning hour of day, duration of storm in hours, total amount of precipitation in inches and intensity of storm in inches per hour. Missing data and trace values are assumed to have a value of zero. Other units that may be used: centimeters.

Example of STORM

NEWCASTLE   STATION NUMBER 486660

LATITUDE 43-51 LONGITUDE 104-13 ELEVATION 4315   WESTON COUNTY

STORM DATA 1948 - 1948
MISSING DATA AND TRACE VALUES ARE ASSUMED TO HAVE A VALUE OF ZERO

DATE	BEGINNING HOUR	DURATION IN HOURS	AMOUNT IN INCHES	INTENSITY INCHES/HOUR
1 AUG 48	19	2	.42	.21
5 AUG 48	14	5	.59	.12
7 AUG 48	17	1	.02	.02
8 AUG 48	4	2	.06	.03
8 AUG 48	8	1	.01	.01
9 AUG 48	17	2	.13	.06
10 AUG 48	17	1	.02	.02
10 AUG 48	20	1	.01	.01
13 AUG 48	17	2	.20	.10
6 SEP 48	6	2	.10	.05
6 SEP 48	10	3	.04	.01
6 SEP 48	24	1	.02	.02
7 SEP 48	4	4	.05	.01
19 SEP 48	8	2	.08	.04
19 SEP 48	24	3	.09	.03
22 SEP 48	5	1	.01	.01
22 SEP 48	13	1	.01	.01
1 OCT 48	22	3	.14	.05
2 OCT 48	5	1	.01	.01
5 OCT 48	16	1	.03	.03
5 OCT 48	22	2	.04	.02
28 OCT 48	17	1	.02	.02
29 OCT 48	5	2	.16	.08
29 OCT 48	8	1	.01	.01
29 OCT 48	11	1	.01	.01
3 NOV 48	18	2	.03	.01
3 NOV 48	24	1	.01	.01
4 NOV 48	2	1	.01	.01
4 NOV 48	4	1	.01	.01
6 NOV 48	23	6	.19	.03
8 NOV 48	23	1	.01	.01
9 NOV 48	1	3	.04	.01
10 NOV 48	3	3	.04	.01
12 NOV 48	1	6	.04	.01
17 NOV 48	13	3	.04	.01
17 NOV 48	18	1	.01	.01
22 NOV 48	19	4	.07	.02
24 NOV 48	12	1	.01	.01
24 NOV 48	20	1	.01	.01
15 DEC 48	2	2	.04	.02
23 DEC 48	24	4	.05	.01
24 DEC 48	17	1	.01	.01

PROGRAMS FOR ONE, THREE AND SIX HOUR CLIMATIC OBSERVATIONS
(precipitation excluded)

LISTDATAH

   This program lists hourly climatic data by month given a station
and month and year range. The daily average is also printed (except for
wind direction). When three or six hour observation data are listed,
blanks are inserted for the hours when the data were not recorded.
Parameters that may be used: air temperature, wet bulb temperature,
dew point, relative humidity, wind speed and wind direction.

HOURLY CLIMATE VALUES FOR AIR TEMPERATURE (F.)
FORT BRIDGER   STATION NUMBER 24118
LATITUDE 41-24 LONGITUDE 110-25 ELEVATION 7003   UINTA COUNTY
JANUARY   1949

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	13	15	22	20	18	19	19	25	24	27	27	29	30	28	28	26	25	24	23	23	23	24	16	16	22
2	15	15	13	12	8	7	2	-2	-2	-1	1	8	7	8	8	6	5	1	-1	-1	-1	-2	-2	-3	4
3	-3	-4	-3	-2	-3	-2	-6	-5	-5	-4	-2	-1	0	2	1	2	-6	-3	-2	-2	-2	-2	-2	-2	-2
4	-1	-2	-2	-4	-4	-4	-3	-3	-3	-2	1	3	4	4	4	4	3	2	0	0	-2	-2	-3	-2	0
5	-2	-4	-1	0	1	1	0	0	-1	4	6	10	12	14	16	15	14	13	14	18	19	21	20		8
6	19	17	19	20	22	22	22	21	21	22	24	25	27	27	29	28	27	25	24	24	25	26	25	24	23
7	24	25	25	24	21	22	22	22	22	24	27	30	30	33	33	32	28	25	20	20	23	25	25	24	25
8	24	24	20	24	25	23	24	23	16	15	14	15	14	12	12	10	10	8	8	8	6	6	5	5	14
9	5	4	3	2	2	2	0	-3	-5	-3	-2	-2	-1	0	0	-2	-2	-5	-7	-9	-7	-8	-7	-7	-2
10	-9	-10	-7	-6	-7	-7	-8	-7	-5	0	-4	-1	0	0	-1	-1	-2	-2	-3	-2	-1	-1	-2	-2	-3
11	0	0	0	0	1	0	1	0	-3	-3	-1	0	7	8	8	11	10	5	6	6	6	8	8		3
12	13	16	17	18	18	17	18	16	17	15	12	14	15	18	18	14	15	12	10	13	12	14	15	10	17
13	16	20	22	22	23	22	19	17	20	20	20	24	23	22	19	18	15	15	13	12	12	12	12	10	18
14	19	20	22	22	23	22	19	17	20	20	20	24	23	22	19	18	15	15	13	12	12	12	12		18
15	15	14	14	14	14	12	11	10	10	11	13	14	14	15	15	15	9	9	10	9	8	9			11
16	9	4	0	1	-1	4	4	5	4	2	3	5	8	12	6	5	2	-1	-1	-2	-1	-5	-5	-7	2
17	-9	-8	-5	-4	-2	-2	-1	4	6	8	9	10	9	10	9	10	9	10	9	10	9	10	9	11	5
18	10	10	9	8	6	4	4	3	1	2	6	9	10	11	10	10	7	4	1	0	0	1	-2	-2	5
19	-2	-6	-7	-4	-4	-8	-8	-10	-10	-9	-8	-5	-3	-3	-3	-4	-5	-6	-6	-4	-4	-4	-3		-6
20	-2	0	1	0	2	2	2	4	6	10	11	10	10	9	8	6	3	1	1	-3	-5	-6	-6		3
21	-10	-8	-9	-4	-4	-6	-2	-2	-3	-2	-2	0	1	2	2	4	4	4	2	4	4	2	0	0	3
22	1	6	13	13	16	16	5	5	7	9	13	14	12	17	14	15	13	14	8	7	6	9	12	13	10
23	12	14	12	11	11	6	6	5	5	4	4	4	2	4	5	6	4	1	-3	-4	-5	-8	-12	-13	-12	2
24	-12	-12	-12	-12	-12	-13	-12	-12	-13	-11	-10	-8	-4	-6	-6	-4	-4	-10	-8	-10	-14	-15	-12	-12	-10
25	-15	-9	-18	-14	-15	-15	-15	-15	-14	-10	-12	-7	-4	-9	-8	-10	-8	-14	-18	-14	-10	-10	-11	-6	-11
26	-14	-10	-13	-14	-19	-12	-14	-14	-7	-7	-8	-8	-5	-1	-2	-2	-7	-9	-7	-8	-6	-5	-8		-8
27	-11	-12	-12	-7	-1	1	4	6	8	9	10	11	12	12	11	10	10	10	9	8	7	5	5	4	4
28	9	2	2	4	4	4	3	2	1	1	2	3	7	7	8	6	5	3	0	-1	-1	-2	-2	-3	2
29	-3	-6	-5	-6	-5	-5	-6	-7	-6	0	3	3	3	8	8	10	10	8	10	11	11	12	11	12	3
30	11	11	11	11	11	11	10	10	11	13	13	15	16	17	15	14	10	8	6	6	6	8	9		11
31	8	8	7	5	2	-2	-3	-1	-1	2	6	8	11	12	11	10	9	6	3	1	0	2	0	2	4

HOURLY CLIMATE VALUES FOR WIND DIRECTION
FORT BRIDGER   STATION NUMBER 24118
LATITUDE 41-24 LONGITUDE 110-25 ELEVATION 7003   UINTA COUNTY
JANUARY   1969

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVE
1	WSW	WSW	WNW	WNW	WSW	W	W	WSW	WSW	W	WSW	WSW	WSW	W	WSW	WSW	WSW	WSW	WSW	WSW	W	W	NW	W	
2	WNW	W	W	WSW	WSW	W	W	W	W	WSW	W	WSW	W	W	WNW	WNW	WNW	WNW	WNW	W	W	W	W	W	
3	W	WNW	WNW	WNW	CALM	CALM	W	S	SSW	SE	SE	SSE	SSE	SE	SE	SE	SSE	CALM	W	WSW	WSW	WSW	W	W	
4	W	W	WSW	WSW	W	W	W	WSW	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	
5	W	WNW	WNW	WNW	WNW	WNW	WNW	W	W	W	W	W	W	W	W	WNW	W	W	W	W	W	W	W	W	
6	WNW	WNW	WNW	WNW	WNW	WNW	WNW	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	
7	WSW	WSW	WSW	WSW	W	W	W	WSW	WSW	W	WNW	W	WNW	WSW	WSW	WSW	W	WNW	SW	SW	SW	WSW	WSW	WSW	
8	WSW	WNW	WNW	W	W	WSW	WSW	W	WNW	WNW	W	WNW	WNW	WNW	WNW	WNW	N	NNW	WNW	N	NE	NE			
9	NE	ENE	ENE	NE	NE	NE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	E	ENE	ENE	ESE	ESE	ENE	
10	ENE	ENE	ENE	E	E	E	E	CALM	E	E	E	ENE	NE	ESE	ESE	SE	SE	SE	ESE	SE	ESE	ESE	ESE	E	
11	E	ESE	CALM	ESE	NE	S	CALM	SE	S	S	S	SE	N	ENE	ENE	ENE	CALM	CALM	CALM	CALM	CALM	CALM	E	E	
12	SE	E	NW	E	SE	NE	CALM	NW	E	CALM	E	E	E	NW	NW	ESE	WSW	W	CALM	CALM	CALM	CALM	CALM	WSW	
13	CALM	W	W	WSW	W	WNW	NNW	S	NNW	NNE	ESE	ENE	E	ESE	ENE	E	ENE	E	ESE	ESE	E	E	E	CALM	
14	NW	W	W	W	W	SW	WSW	WSW	WSW	WSW	WSW	W	W	W	W	WNW	WNM	W	N	WSW	WSW	WSW	WSW	WSW	
15	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	W	W	W	W	W	WNW	WNW	CALM	SE	SE	SE	SE	SE	SE	ESE		
16	ESE	SE	SE	ESE	ESE	SE	ESE	ESE	ESE	SE	SE	SE	SE	ESE	ESE	ESE	E	E	NE	NE	NE	SW	CALM	W	
17	SW	W	W	W	WSW	WSW	WSW	WSW	WSW	W	WSW	W	WSW	W	SW	W	W	WSW	WSW	WSW	WSW	WSW	WSW	WSW	
18	WSW	W	W	W	WSW	WSW	WSW	WSW	WSW	W	WSW	H	WSW	W	W	W	W	WNW	WNW	WSW	WSW	WSW	WSW	WSW	
19	W	WSW	CALM	CALM	SE	ESE	CALM	CALM	N	NE	E	NE	NW	N	NW	NW	NE	E	NW	N	NE	WNW	W	W	
20	W	CALM	CALM	CALM	CALM	CALM	CALM	W	W	WNW	W	W	WNW	WNW	WNW	WNW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	
21	WSW	S	SSW	S	SE	SE	CALM	CALM	CALM	CALM	CALM	CALM	ESE	CALM	CALM	SE	SE	SSE	ENE	WSW	SSE	S	NE	WSW	
22	SSE	S	SSW	SSW	SSW	S	CALM	NE	ENE	NE	WSW	WNW	NW	WNW	ESE	WSW	S	CALM	ESE	ESE	CALM	W	W	CALM	
23	CALM	E	E	NE	NE	NE	N	NE	NE	NNE	NNE	NE	NE	E	NW	N	N	NE	CALM	E	CALM	E	NW	N	NW
24	NE	E	ENE	ENE	ENE	ESE	CALM	N	NE	ENE	NE	NNE	E	E	WNW	WNW	CALM	S	CALM	CALM	WNW	W	W	WNW	
25	W	WNW	S	W	S	CALM	N	N	CALM	CALM	CALM	CALM	CALM	CALM	CALM	CALM	SW	SW	SW	W	WSW	WSW	WSW	WSW	
26	W	NNW	ESE	E	S	WNW	WSW	WNW	CALM	CALM	CALM	CALM	CALM	CALM	CALM	CALM	NW	NW	CALM	CALM	CALM	CALM	CALM	CALM	
27	E	W	W	WSW	WSW	W	W	WSW	WSW	W	W	W	W	WNW	W	W	W	W	W	W	W	WNW	WNW	W	
28	NW	NE	ENE	ESE	SE	ESE	ESE	ESE	ESE	SE	SE	SE	S	W	WNW	WSW	W	W	W	W	W	W	W	W	
29	W	WSW	W	W	W	W	W	W	WSW	WNW	W	W	WSW	WSW	W	W	W	WSW	WNW	W	W	WSW	W	W	
30	W	W	W	W	W	W	W	W	WNW	WNW	WNW	WNW	WSW	WSW	W	W	W	W	W	W	WSW	W	W	W	
31	W	W	W	W	W	W	W	WNW	W	W	WNW	WNW	WNW	W	W	WSW	WSW	WSW	WSW	WSW	W	W	WSW	WSW	

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Example of LISTDATAH

SNOW COURSE DATA

Data for snow course measurements made and published since 1919 by the Soil Conservation Service have been made a part of WRDS. These data are snow depth, water equivalent and snow density for snow course measurements made primarily in the mountains of Wyoming. Included are data for some snow courses that are near Wyoming in adjacent states. Measurements are generally made on or near the first of the months of January through June. Supplemental measurements are sometimes made in the middle of these months.

PROGRAMS FOR SNOW COURSE DATA

SNOWCOURSE

Data and summary statistics for any specified station and years can
be obtained with this program. If there are supplemental data, they
will be printed separately. Options are to print the data, the data
and statistics or statistics only.

CASPER MOUNTAIN SNOW COURSE IN NORTH PLATTE RIVER BASIN, SCS NO. 6G1MP
LATITUDE 42-44- 0   LONGITUDE 106-18- 0   ELEVATION 7940
SECTION 16 TOWNSHIP 32N RANGE 79W   6TH PRINCIPAL MERIDIAN REF. NO.   160008

JANUARY 1			FEBRUARY 1			MARCH 1			APRIL 1			MAY 1			JUNE 1		
OBSERVATION DATE			OBSERVATION DATE			OBSERVATION DATE			OBSERVATION DATE			OBSERVATION DATE			OBSERVATION DATE		
SNOW DEPTH INCH	SNOW DENS PERCNT	WATER EQUIV INCH	SNOW DEPTH INCH	SNOW DENS PERCNT	WATER EQUIV INCH	SNOW DEPTH INCH	SNOW DENS PERCNT	WATER EQUIV INCH	SNOW DEPTH INCH	SNOW DENS PERCNT	WATER EQUIV INCH	SNOW DEPTH INCH	SNOW DENS PERCNT	WATER EQUIV INCH	SNOW DEPTH INCH	SNOW DENS PERCNT	WATER EQUIV INCH
DEC 30, 60			JAN. 31, 61			MAR. 1, 61			MAR. 29, 61			MAY 3, 61					
27	20	5.5	29	24	6.9	42	24	10.0	62	25	15.3	43	34	14.8			
DEC 29, 61			JAN. 31, 62			FEB. 28, 62			MAR. 29, 62			MAY 8, 62					
32	27	8.8	44	30	13.0	52	28	14.8	64	29	18.5	22	41	9.1			
JAN. 2, 63			JAN. 31, 63			MAR. 4, 63			MAR. 28, 63			MAY 1, 63					
12	17	2.0	24	20	4.9	60	15	9.2	42	27	11.3	39	38	14.9			
DEC 31, 63			JAN. 31, 64			FEB. 28, 64			APR 1, 64			MAY 1, 64					
13	13	1.7	26	26	6.7	45	26	11.6	49	32	15.6	75	37	27.4			
JAN. 4, 65			JAN. 28, 65			FEB. 25, 65			MAR. 31, 65			APR 30, 65					
23	20	4.7	37	18	6.5	40	28	11.2	46	31	14.3	39	35	13.8			
JAN. 3, 66			JAN. 31, 66			MAR. 2, 66			MAR. 31, 66			MAY 2, 66					
17	20	3.4	25	24	6.0	39	25	9.6	34	31	10.4	39	36	13.9			
JAN. 5, 67			FEB. 1, 67			FEB. 27, 67			MAR. 31, 67			MAY 1, 67					
34	24	8.2	41	29	12.0	53	29	15.2	46	35	16.0	61	30	18.4			
JAN. 3, 68			JAN. 30, 68			MAR. 1, 68			APR 1, 68			MAY 1, 68					
40	25	9.9	41	30	12.5	54	29	15.4	49	36	17.7	68	37	25.4			
DEC 31, 68			JAN. 30, 69			MAR. 3, 69			APR 1, 69			APR 28, 69					
27	25	6.8	32	27	8.7	42	27	11.2	46	31	14.2	53	32	17.2			
JAN. 5, 70			JAN. 29, 70			FEB. 20, 70			MAR. 31, 70			APR 28, 70					
38	23	8.8	48	24	11.4	42	29	12.2	77	29	22.2	76	37	28.1			
JAN. 6, 71			JAN. 28, 71			FEB. 27, 71			APR 1, 71			MAY 1, 71			JUNE 1, 71		
30	28	8.5	33	28	9.4	42	23	9.6	55	28	15.5	53	37	19.6	37	40	14.9
JAN. 4, 72			FEB. 1, 72			FEB. 29, 72			MAR. 31, 72			APR 28, 72					
36	24	8.6	39	27	10.6	40	30	12.1	52	29	15.0	59	31	18.2			

CASPER MOUNTAIN SNOW COURSE IN NORTH PLATTE RIVER BASIN, SCS NO. 6G1MP
LATITUDE 42-44- 0 LONGITUDE 106-18- 0   ELEVATION 7940
SECTION 16 TOWNSHIP 32N RANGE 79W   6TH PRINCIPAL MERIDIAN REF. NO.   160008

••• SNOW COURSE STATISTICS •••

FIRST OF THE MONTH OBSERVATIONS

	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE
WATER EQUIVALENT (INCHES)						
NO. OF OBSERVATIONS	12	12	12	12	12	1
MEAN	6.4	9.0	11.8	15.5	18.4	14.9
STANDARD DEVIATION	2.9	2.8	2.2	3.1	5.9	-99.9
COEF. OF VARIATION	44.8	31.2	18.7	20.0	31.9	-99.9
COEF. OF SKEW	-.5	.0	.5	.4	.4	-99.9

	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE
SNOW DEPTH (INCHES)						
NO. OF OBSERVATIONS	12	12	12	12	12	1
MEAN	27.4	34.9	45.9	51.8	52.3	37.0
STANDARD DEVIATION	9.5	7.9	6.9	11.4	16.5	-99.9
COEF. OF VARIATION	34.6	22.7	15.1	22.0	31.5	-99.9
COEF. OF SKEW	-.4	.1	.8	.7	-.1	-99.9

	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE
SNOW DENSITY (PERCENT)						
NO. OF OBSERVATIONS	12	12	12	12	12	1
MEAN	22.3	25.6	26.0	30.1	35.5	40.3
STANDARD DEVIATION	4.4	3.9	4.1	3.2	3.2	-99.9
COEF. OF VARIATION	19.8	15.2	15.6	10.5	8.9	-99.9
COEF. OF SKEW	-.6	-.7	-1.5	.3	-.2	-99.9

-99.9 INDICATES INSUFFICIENT DATA

CASPER MOUNTAIN SNOW COURSE IN NORTH PLATTE RIVER BASIN, SCS NO. 6G1MP
LATITUDE 42-44- 0   LONGITUDE 106-18- 0   ELEVATION 7940
SECTION 16 TOWNSHIP 32N RANGE 79W   6TH PRINCIPAL MERIDIAN REF. NO.   160008

******SUPPLEMENTAL DATA******

YEAR	JANUARY 15				FEBRUARY 15				MARCH 15				APRIL 15				MAY 15				JUNE 15			
	OBSERVATION DATE				OBSERVATION DATE				OBSERVATION DATE				OBSERVATION DATE				OBSERVATION DATE				OBSERVATION DATE			
	SNOW DEPTH INCH	SNOW DENS. PERCNT	WATER EQUIV INCH		SNOW DEPTH INCH	SNOW DENS. PERCNT	WATER EQUIV INCH		SNOW DEPTH INCH	SNOW DENS. PERCNT	WATER EQUIV INCH		SNOW DEPTH INCH	SNOW DENS. PERCNT	WATER EQUIV INCH		SNOW DEPTH INCH	SNOW DENS. PERCNT	WATER EQUIV INCH		SNOW DEPTH INCH	SNOW DENS. PERCNT	WATER EQUIV INCH	
1961	JAN. 16, 61	26	23	5.9	FEB. 16, 61	38	25	9.4	MAR. 15, 61	41	26	10.6	APR 14, 61	68	25	16.8								
1962	JAN. 17, 62	44	27	11.7	FEB. 15, 62	44	30	13.1	MAR. 14, 62	53	31	16.4	APR 16, 62	55	34	18.6								
1963	JAN. 16, 63	23	18	4.1	FEB. 13, 63	25	21	5.2	MAR. 15, 63	52	22	11.5	APR 15, 63	33	32	10.7								
1964	JAN. 15, 64	27	19	5.1	FEB. 14, 64	55	17	9.3	MAR. 13, 64	47	29	13.5	APR 15, 64	85	31	26.4	MAY 8, 64	81	36	29.5				
1965	JAN. 15, 65	22	22	4.8	FEB. 16, 65	46	24	10.9	MAR. 15, 65	48	28	13.4	APR 15, 65	57	28	16.0	MAY 10, 65	65	25	16.5				
1966	JAN. 14, 66	17	21	3.5	FEB. 15, 66	48	18	8.8	MAR. 15, 66	37	28	10.4	APR 15, 66	39	32	12.5								
1967	JAN. 16, 67	41	26	10.7	FEB. 15, 67	46	29	13.4	MAR. 15, 67	52	31	16.2	B 17, 67	53	32	16.8	MAY 15, 67	52	35	18.2				
1968	JAN. 15, 68	37	29	10.6	FEB. 15, 68	40	32	12.7	MAR. 15, 68	56	31	17.2	APR 15, 68	60	36	21.6	MAY 15, 68	57	39	22.0				
1969	JAN. 15, 69	30	29	8.6	FEB. 14, 69	32	30	9.6	MAR. 15, 69	45	28	12.4	APR 15, 69	46	32	14.7	MAY 16, 69	19	40	7.6				
1970													APR 16, 70	73	37	27.1	MAY 14, 70	62	38	23.8				
1971					FEB. 16, 71	36	26	9.5	MAR. 15, 71	41	27	11.0	APR 21, 71	64	28	17.7	MAY 14, 71	49	38	18.8				
1972	JAN. 17, 72	39	25	9.6	FEB. 14, 72	48	26	12.5	MAR. 15, 72	44	29	12.6	APR 15, 72	53	32	16.9	MAY 17, 72	42	40	16.8				

Example of SNOWCOURSE

SNOWDATES

Data are presently complete on the system through 1977. A listing
of all stations and years on file would be too voluminous to include
herein. A complete listing in the format shown in the following
example can be obtained by requesting SNOWDATES.

Example of SNOWDATES

*** LISTING OF SNOW DATA ***

OLD FAITHFUL SNOW COURSE IN MADISON RIVER BASIN, SCS NO.
LATITUDE   0- 0- 0   LONGITUDE   9- 0- 0   ELEVATION 7360
                                                            REF. NO.   10001

                    1975 TO 1976

NORRIS BASIN SNOW COURSE IN MADISON RIVER BASIN, SCS NO. 10E2
LATITUDE 44-44- 0   LONGITUDE 110-42- 0   ELEVATION 7500
                                                            REF. NO.   10002

                    1936 TO 1971

                    1973 TO 1976

21 MILE SNOW COURSE. IN MADISON RIVER BASIN, SCS NO. 11E6
LATITUDE 44-54- 0   LONGITUDE 111- 4- 0   ELEVATION 7150
SECTION 1 TOWNSHIP 11S RANGE   5E MONTANA PRINCIPAL MERIDIAN REF. NO.   10003

                    1973 TO 1976

WEST YELLOWSTONE SNOW COURSE IN MADISON RIVER BASIN, SCS NO. 11E7
LATITUDE 44-49- 0   LONGITUDE 111- 6- 0   ELEVATION 6700
SECTION 34 TOWNSHIP 13S RANGE   5E MONTANA PRINCIPAL MERIDIAN REF. NO.   10004

                    1934 TO 1976

MADISON PLATEAU SNOW COURSE IN MADISON RIVER BASIN, SCS NO. 11E31
LATITUDE 44-35- 0   LONGITUDE 111- 9- 0   ELEVATION 7750
SECTION 28 TOWNSHIP 14S RANGE   5E MONTANA PRINCIPAL MERIDIAN REF. NO.   10005

                    1968 TO 1972

WHISKEY CREEK SNOW COURSE IN MADISON RIVER BASIN, SCS NO. 11E30
LATITUDE 44-36- 0   LONGITUDE 111-11- 0   ELEVATION 6800
SECTION 19 TOWNSHIP 14S RANGE   5E MONTANA PRINCIPAL MERIDIAN REF. NO.   10006

                    1967 TO 1972

CANYON SNOW COURSE IN YELLOWSTONE RIVER BASIN, SCS NO. 10E3
LATITUDE 44-44- 0   LONGITUDE 110-30- 0   ELEVATION 7750
                                                            REF. NO.   20001

                    1937 TO 1976

SELECTED REFERENCES

Smith, Verne E., Vicki C. Pelton and Sally A. Bender. 1976. "Water
    Resources Data System." Water Resources Research Institute,
    Series No. 61. Laramie, Wyoming.

APPENDIX

USER CHARGES

The following prices will be charged for job requests. Although
more than one kind of data, e.g. surface water or water quality (refer
to report No. 61), may be included in a request, only one job setup
is charged per request.

CLIMATIC DATA PROGRAMS

Job Setup – irrespective of number of analyses or stations	$20.00
AVEPREC (per station)	3.00
CUM (per station-year)	0.25
DAILYPRINTP (per station-year)	0.25
DEGREE (per station-year)	0.25
DOUBLEMASS (per station-combination)	3.00
LISTDATAD (per type-station-year)	0.25
LISTDATAH (per type-station-month)	0.25
LISTDATAP (per station-month)	0.25
LISTDATESD	Job Setup only
LISTDATESP	Job Setup only
MONTHLY (per type-station)	3.00
NORMALTEMP (per station)	3.00
OCCUR (per station)	3.00
PARGREATER (per type-station)	3.00
PLOTDAYD (per type-station-year)	0.50
PLOTDAYP (per station-year)	0.50
PLOTHOURP (per station-month)	0.50
PLOTMONTH (per type-station)	3.00
PLOTYEAR (per type-station)	3.00
PLRUNOFF (per station)	3.00
RUN (per station)	3.00
SNOWGREATER (per station)	3.00
STORM (per station-year)	3.00
TEMPBELOW (per station)	3.00

SNOWCOURSE PROGRAMS

Job Setup – irrespective of number of analyses or stations	$20.00
SNOWCOURSE (per station)	0.50
SNOWDATES	Job Setup only

EXAMPLE

Assume a request for mean daily temperature and daily precipitation for printouts and plots for 15 years at each of two stations, DOUBLEMASS between the two stations and snow course data at 3 stations is made. The cost would be:

Job Setup		$20.00
LISTDATAD	60 type-station-years @ $0.25	15.00
PLOTDAYD	60 type-station-years @ $0.50	30.00
DOUBLEMASS	1 station combination @ $3.00	3.00
SNOWCOURSE	3 stations $0.50	1.50
	TOTAL	$69.50