COLORADO CLIMATE SUMMARY

WATER-YEAR SERIES

(October 1983-September 1984)

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Nolan J. Doesken

Thomas B. McKee

Climatology Report No. 85-1

DEPARTMENT OF ATMOSPHERIC SCIENCE
COLORADO STATE UNIVERSITY
FORT COLLINS, COLORADO

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Fort Collins, CO 80523

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We are very thankful to all of the National Weather Service (NWS) cooperative weather observers (more than 200) whose diligence in taking daily weather observations makes it possible to monitor and document the climate of our state. William Tate and Michael Elias of the NWS both deserve a lot of credit for maintaining this network in Colorado. While sophisticated automated weather stations have become ever more popular for collecting meteorological data, the most reliable and cost effective data network continues to be the NWS cooperative network.

The authors also wish to express their appreciation for the many hours of careful data and word processing done by Odilia Panella and Patti Fylling in order to stay on top of each new month of Colorado climate information.

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TABLE OF CONTENTS

Page

ACKNOWLEDGMENTS..... ii

TABLE OF CONTENTS..... iii

LIST OF FIGURES..... iv

LIST OF TABLES.....viii

I. INTRODUCTION..... 1

II. EXPLANATION OF HEATING DEGREE DAYS..... 5

III. 1984 WATER YEAR IN REVIEW..... 7

October 1983..... 13

November 1983..... 21

December 1983..... 30

January 1984..... 39

February 1984..... 48

March 1984..... 57

April 1984..... 66

May 1984..... 74

June 1984..... 84

July 1984..... 94

August 1984..... 103

September 1984..... 112

LIST OF FIGURES

Month/Year	Figure	Description	Page
October 1983	1.	October 1983 precipitation amounts (inches)	16
	2.	Precipitation for October 1983 as a percent of the 1951-1980 average	17
	3.	Temperatures for October 1983 in degrees Fahrenheit (in parentheses) and the departures from the 1961-1980 average	18
November 1983	1.	November 1983 precipitation amounts (inches)	25
	2.	Precipitation for November 1983 as a percent of the 1961-1980 average	26
	3.	Precipitation for October 1983 through November 1983 as a percent of the 1961-1980 average	27
	4.	Temperatures for November 1983 in degrees Fahrenheit (in parentheses) and the departures from the 1961-1980 average	28
December 1983	1.	December 1983 precipitation amounts (inches)	34
	2.	Precipitation for December 1983 as a percent of the 1961-1980 average	35
	3.	Precipitation for October 1983 through December 1983 as a percent of the 1961-1980 average	36
	4	Temperatures for December 1983 in degrees Fahrenheit (in parentheses) and the departures from the 1961-1980 average	37
January 1984	1.	January 1984 precipitation amounts (inches)	43
	2.	Precipitation for January 1984 as a percent of the 1961-1980 average	44

Month/Year	Figure	Description	Page
	3.	Precipitation for October 1983 through January 1984 as a percent of the 1961-1980 average	45
	4.	Temperatures for January 1984 in degrees Fahrenheit (in parentheses) and the departures from the 1961-1980 average	46
February 1984	1.	February 1984 precipitation amounts (inches)	52
	2.	Precipitation for February 1984 as a percent of the 1961-1980 average	53
	3.	Precipitation for October 1983 through February 1984 as a percent of the 1961-1980 average	54
	4.	Temperatures for February 1984 in degrees Fahrenheit (in parentheses) and the departures from the 1961-1980 average	55
March 1984	1.	March 1984 precipitation amounts (inches)	61
	2.	Precipitation for March 1984 as a percent of the 1961-1980 average	62
	3.	Precipitation for October 1983 through March 1984 as a percent of the 1961-1980 average	63
	4.	Temperatures for March 1984 in degrees Fahrenheit (in parentheses) and the departures from the 1961-1980 average	64
April 1984	1.	April 1984 precipitation amounts (inches)	69
	2.	Precipitation for April 1984 as a percent of the 1961-1980 average	70
	3.	Precipitation for October 1983 through April 1984 as a percent of the 1961-1980 average	71
	4.	Temperatures for April 1984 in degrees Fahrenheit (in parentheses) and the departures from the 1961-1980 average	72

Month/Year	Figure	Description	Page
May 1984	1.	May 1984 precipitation amounts (inches)	77
	2.	Precipitation for May 1984 as a percent of the 1961-1980 average	78
	3.	Precipitation for October 1983 through May 1984 as a percent of the 1961-1980 average	79
	4.	Temperatures for May 1984 in degrees Fahrenheit (in parentheses) and the departures from the 1961-1980 average	80
	5.	May 1984 growing degree days (see text for definition	81
June 1984	1.	June 1984 precipitation amounts (inches)	87
	2.	Precipitation for June 1984 as a percent of the 1961-1980 average	88
	3.	Precipitation for October 1983 through June 1984 as a percent of the 1961-1980 average	89
	4.	Temperatures for June 1984 in degrees Fahrenheit (in parentheses) and the departures from the 1961-1980 average	90
	5.	June 1984 growing degree days and total since May 1 (in parentheses)	91
July 1984	1.	July 1984 precipitation amounts (inches)	97
	2.	Precipitation for July 1984 as a percent of the 1961-1980 average	98
	3.	Precipitation for October 1983 through July 1984 as a percent of the 1961-1980 average	99
	4.	Temperatures for July 1984 in degrees Fahrenheit (in parentheses) and the departures from the 1961-1980 average	100

Month/Year	Figure	Description	Page
	5.	July 1984 growing degree days and total since May 1 (in parentheses). Refer to May issue of Colorado Climate for definition of growing degree days	101
August 1984	1.	August 1984 precipitation amounts (inches)	106
	2.	Precipitation for August 1984 as a percent of the 1961-1980 average	107
	3.	Precipitation for October 1983 through August 1984 as a percent of the 1961-1980 average	108
	4.	Temperatures for August 1984 in degrees Fahrenheit (in parentheses) and the departures from the 1961-1980 average	109
	5.	August 1984 growing degree days and total since May 1 (in parentheses). Refer to May issue of Colorado Climate for definition of growing degree days	110
September 1984	1.	September 1984 precipitation amounts (inches)	116
	2.	Precipitation for September 1984 as a percent of the 1961-1980 average	117
	3.	May through September 1984 "growing season" precipitation as a percent of the 1961-1980 average	118
	4.	Precipitation for the complete 1984 water-year (October 1983 through September 1984) as a percent of the 1961-1980 average	119
	5.	Temperatures for September 1984 in degrees Fahrenheit (in parentheses) and the departures from the 1961-1980 average	120
	6.	September 1984 growing degree days and growing season total (May 1-September 30)	121

LIST OF TABLES

Month/Year	Table	Description	Page
October 1983	1.	Colorado Heating Degree Day Data through October 1983	19
	2.	Colorado Cooling Degree Day Data through October 1983	20
November 1983	1.	Colorado Heating Degree Day Data through November 1983	29
December 1983	1.	Colorado Heating Degree Day Data through December 1983	38
January 1984	1.	Colorado Heating Degree Day Data through January 1984	47
February 1984	1.	Colorado Heating Degree Day Data through February 1984	56
March 1984	1.	Colorado Heating Degree Day Data through March 1984	65
April 1984	1.	Colorado Heating Degree Day Data through April 1984	73
May 1984	1.	Colorado Heating Degree Day Data through May 1984	82
	2.	Colorado Cooling Degree Day Data through May 1984	83
June 1984	1.	Colorado Heating Degree Day Data through June 1984	92
	2.	Colorado Cooling Degree Day Data through June 1984	93
July 1984	1.	Colorado Cooling Degree Day Data through July 1984	102
August 1984	1.	Colorado Cooling Degree Day Data through August 1984	111
September 1984	1.	Colorado Heating Degree Day Data through September 1984	122
	2.	Colorado Cooling Degree Day Data through September 1984	123

I. INTRODUCTION

Climate monitoring on a near real-time basis is one of the important responsibilities of the Colorado Climate Center. This report is the 7th in an ongoing series of water-year climate summaries prepared by the Colorado Climate Center. This annual summary is a collection of twelve individual monthly summaries with additional narrative and explanations.

The Colorado Climate Center first began preparing these monthly climate summaries in January 1977 in the midst of the State's severe winter drought. Since then, the reports have evolved into brief but comprehensive narrative and map descriptions of each month's climate compared to long-term average conditions. A narrative of daily weather events and extremes is presented. Energy related concerns in Colorado have led to increased emphasis on the use of degree day information.

The water year is defined as the 12-month period from October 1 through September 30. That period is much more practical than the calendar year for discussing water in Colorado because it is well correlated with the state's water storage -- water usage cycle. In October, snow usually begins to accumulate in the high mountains. As winter progresses, the snowpack normally continues to build up. This snow is the frozen reservoir which supports the huge ski and winter recreation industry. Eventually it supplies much of the water for human consumption, for extensive irrigation, for industry, and to satisfy long-standing stream flow compacts with neighboring states. Irrigated agriculture still accounts for the vast majority of water used in

Colorado. Therefore demand for water peaks during the summer and tapers off as temperatures drop, crops are harvested, and autumn arrives. September marks an appropriate end to the water year.

Because of the crucial importance of water to Colorado, this publication emphasizes precipitation and water-year accumulated precipitation. Comparisons with long-term averages are made to help determine which parts of the state are wetter or drier than average. This makes it possible to document the availability of water resources and to assess potential drought situations.

Monthly average temperature information is also presented for several locations and compared to long-term averages. This is supplemented by heating degree day information for parts of the state (an explanation of heating degree days is given in Section II which follows). Comparisons are made with long-term averages as well as with the previous year's data. This provides a simple way of comparing energy consumption for space heating with actual climatic conditions. During the summer months cooling degree day data are also compiled to help compare hot temperatures to energy requirements for air conditioning.

A new feature was added for the 1984 growing season. Monthly and seasonal growing degree day totals were calculated for selected stations, mostly in agricultural areas. Growing degree days are used to access the development and yield potential of agricultural crops through the growing season. A number of different definitions for growing degree days exist for different crops. We used the traditional definition used for corn. This definition is shown on page 76 in the May 1984 summary.

Specific daily temperature and precipitation data are not listed here. However, for each month, significant highlights are outlined including temperature variations and extremes, precipitation events, and major storms. In an abbreviated form, this gives a general narrative description of the daily weather patterns throughout the year. Daily data can be obtained in digital and/or hard copy form from the Colorado Climate Center and the National Climatic Data Center (Asheville, NC). Much of the daily data are published in the government document Climatological Data.

Most temperature and precipitation data used in the monthly summaries were obtained from the National Weather Service cooperative observer network. Data from the major National Weather Service stations such as Denver and Grand Junction are also used extensively.

The averages which are used in this report for both temperature and precipitation were calculated using 1961-1980 data. Heating and cooling degree day normals were based on 1951-1980 data.

The written descriptions give a good general accounting of each month's weather, but the majority of information is contained on the maps which accompany each report. For most months, actual precipitation amounts, monthly precipitation compared to average, water-year accumulated precipitation compared to average, and temperatures compared to average, are displayed on maps. For each month during the summer, growing degree day data were also presented on maps. Heating and cooling degree days were presented in tabular form only. The accuracy of all of these maps and tables is usually quite good. However, these reports were initially prepared soon after the end of each month, and preliminary information had to be used. Therefore, some of the

precipitation, temperature and heating and cooling degree day values may differ slightly from what was later published by the National Climatic Data Center.

II. EXPLANATION OF HEATING DEGREE DAYS

Many climatic factors affect fuel consumption for heating. Wind, solar radiation, and humidity all play a part, but temperature is by far the most important element. Very simply, the colder it gets, the more energy is needed to stay warm.

A simple index, given the name heating degree days, was devised several years ago to relate air temperatures to energy consumption (for heating). The number of heating degrees for a given day is calculated by subtracting the mean daily temperature (the average of the daily high and low temperature) from 65°F. Sixty-five degrees is used as the base temperature because at that temperature a typical building will not require any heating to maintain comfortable indoor temperatures. That difference (65°F minus the mean daily temperature) is the number of heating degrees for that day. The daily values are accumulated throughout the heating season to give heating degree day totals. Different base temperatures can be used to calculate heating degree days, but 65° is the long standing traditional base.

The heating degree day total for a month or for an entire heating season is approximately proportional to the quantity of fuel consumed for heating. Therefore, the colder it gets and the longer is stays cold, the more heating degree days are accumulated and the more energy is required to heat buildings to a comfortable temperature.

So why is this important? Very simply, if you know how much energy you have used for heating your home or business during a certain period of time, and if you also know the heating degree day total for the same period, you can then establish an energy consumption ratio. With that

information you can then make reasonable estimates of your future energy consumption and costs. Also, you can easily check the success and calculate the savings resulting from energy conservation measures such as new insulation, storm windows or lowering the thermostat.

Cooling degree days are calculated in a similar fashion. Cooling degrees occur each day the daily mean temperature is above 65°F. They are accumulated each day throughout the cooling season and are roughly proportional to the amount of energy required to cool a building to a comfortable inside temperature. Cooling degree days are less useful than heating degree days, especially here in Colorado where air conditioning requirements are minimal in many parts of the state. However, they still offer a means of making general comparisons from site to site, year to year, or month to month.

III. 1984 WATER YEAR IN REVIEW

For the third consecutive year the majority of Colorado received above average precipitation. Precipitation exceeded 150% of average over portions of the Northern and Central Mountains and the Yampa, White, and Colorado River basins. Temperature conditions can best be described as a cold winter followed by a slightly warmer than average summer. Water year temperatures ended up one to two degrees below average over most of the state except in western Colorado where a few stations were near or slightly warmer than average.

The 1984 water year got off to a pleasant start as most of Colorado enjoyed below average precipitation and above average temperatures. Above average precipitation was limited to the northwest corner. The first major mountain snowstorms hit during the second week of October -- right on schedule.

After a summerlike beginning, November weather took a turn for the terrible. One storm after another pounded the mountains. The Eastern Plains also took a beating. A post-Thanksgiving blizzard, which closely resembled the devastating Christmas Eve storm of 1982, brought Denver transportation and most of the northeast plains to a halt. Except for the Arkansas Valley, most of Colorado received 200 to 400% of the average November precipitation.

December brought no improvements to Colorado's early winter weather. Temperatures remained seasonal west of the Continental Divide, but it was only because of the constant barrage of Pacific storm systems which piled up snow to record depths for so early in the winter. At the

same time, areas east of the mountains suffered through one of the coldest months ever observed. A pre-Christmas cold wave held temperatures below zero day and night for 5 straight days over much of the Front Range and Eastern Plains.

January, normally the coldest month of the year for the state, seemed almost pleasant after the fury of December. Precipitation was light, especially in the west of the mountains. Temperatures were colder than average statewide. This was the result of clear skies and deep snow in the mountains which helped cold air to stagnate in the mountain valleys. A brief but memorable cold wave in midmonth dropped temperatures to record levels over much of the state with readings approaching -30°F as far south as the Arkansas Valley.

Mountain precipitation was below average again in February, but very cold air still filled the snowcovered western valleys. A series of March-like blizzards deposited unusual amounts of snow over northeastern plains with some areas totalling nearly 2 feet for the month, more than 400% of average.

March was true to form with an interesting combination of pleasant and stormy weather. Temperatures averaged a little cooler than normal while most areas were near or wetter than average. March lived up to its reputation as a snowy month east of the mountains with monthly snowfall of at least a foot over much of the plains.

Cold, wet weather continued to grip Colorado throughout most of April. Many areas on the eastern Plains received more than double their average precipitation. Two more big snowstorms buried northeastern Colorado bringing winter snowfall totals to record levels close to 100". Mountain snowpack also continued to build and at the end of April nearly

40% of all snow courses in the Colorado and Gunnison river drainages set new records.

Rapid snowmelt followed by flooding and mudslides were a result of above average May temperatures. The peak flows on most of the major Western Slope rivers occurred on May 25th. There was some serious local flooding but with the record snowpack that had existed at the beginning of the month, conditions could have been much worse. May precipitation was less than average over almost all of Colorado and many reservoirs had released stored water in anticipation of the heavy runoff. With the warm May weather, the snowmelt season was spread over several more weeks than in 1983 when major flooding occurred in June.

June has always been known as a dry month in the mountains and western valleys of Colorado. But for the 2nd year in a row record breaking precipitation fell. Fortunately, temperatures were cold enough to slow further snowmelt and reduce the potential for even more flooding. Precipitation east of the mountains was, on the whole, considerably less than average. However, one localized storm on June 13, which originated over the western Denver metropolitan area, got national attention. In a short time very large hail and several inches of rain caused far in excess of $100 million dollars damage.

July and August combined to bring warmer than average temperatures to the state. Precipitation on the eastern Plains was below average but the "southwest monsoon" brought unusually heavy summer precipitation to areas in and near the mountains.

The 1984 water year ended with a dry September except in parts of the mountains where the wet pattern of the last several months continued. Summer came to an abrupt halt in the last week of September

as snow and subfreezing temperatures hit most of the state. This was the second year in a row with the growing season shortened by an abnormally early and severe freeze.

Summarizing the 1984 water year, it was the third year in a row of abundant moisture for the state. With plenty of surface water for irrigation, agricultural production was high. Production of major cash crops ranging from corn to potatoes was at or near record levels. Winter wheat and some Western Slope fruits were the only crops which experienced a decline in production from 1983. Winter wheat yield was down as a result of a dry late summer and early fall in 1983 on the plains followed by a dry May. Western Slope fruit production suffered from freeze damage in late April. The 1985 winter wheat crop got off to only a fair start as hot and dry late summer weather depleted soil moisture reserves and hindered germination and early growth.

While crop production was high, it certainly was not an easy year for ranchers and farmers. The large number of major blizzards across the Eastern Plains from November through April, the early and very deep snowpack in the mountains and western valleys, and the extreme cold of the winter claimed the lives of many livestock and resulted in more work and fuel expenses for Colorado's livestock producers. It also led to a short supply and high cost for hay. The same weather conditions put extreme stress on many of Colorado's elk and deer herds. The Colorado Division of Wildlife mounted an extensive wildlife feeding program to ward off widespread wildlife die off.

For the second year in a row, the highlight of the water year was record snowpack and runoff. While damaging flooding did occur in May and June in parts of Colorado, damages were not as bad as they were in

1983. However, total runoff exceeded the 1983 value on many tributaries to the Colorado River and established new records at several locations.

After two consecutive very wet years in an near the mountains, mudslides became a serious and costly problem. Heavy damage occurred near Vail, and for a time substantial portions of the town of Aspen were threatened. At the end of September, rivers were still flowing higher and faster than usual and reservoir storage throughout the state was well above average. As a result of the high water, the rafting and kayaking season was long and challenging. But fly fisherman had difficulties in getting to some of their favorite holes.

Recreation and tourism had a good year in 1984. The deep, early snows got the ski season off to a great start and provided a super base to keep many ski areas open into April and even May. Frequent and heavy mountain thunderstorms dampened many summer campers, hikers, and outdoor recreationalist but kept the vegetation green and lush and greatly reduced the threat of forest fires.

Snow removal costs were high. The heavy storms of November and the continuous December mountain snowfall kept snowplow operators going around the clock. Denver handled their post-Thanksgiving storm much better than the previous year's Christmas Eve blizzards but not without great expense. The deep early snowpack in the mountains and also on the plains allowed blowing and drifting snow to be a problem even when it wasn't snowing. The steady string of blizzards on the plains on into April continued to cause snow removal challenges. The people of Limon welcomed stranded travelers into their community as Interstate 70 was closed numerous times during the winter.

The most concentrated and costly impact of 1984's weather was the devastation produced across substantial areas of the Denver metropolitan by a huge June hailstorm. But for many areas on the Eastern Plains hail and severe thunderstorm damage was less than average. During recent years hail has caused incredible damage all up and down the Front Range. The impression is that hail size and frequency has been increasing. In truth, we seem to be seeing the inevitable result of population growth and urban development whereby we are getting steadily more vulnerable to the natural whims of the weather. Meteorologically, their has been no indication of increased hail activity on the plains as a whole.

Major downslope windstorms weren't much of a problem during the 1984 water year.

Heating degree day totals, an indicator of the amount of fuel needed for heating homes, school and businesses, were above average over most of Colorado. Totals were typically 2 to 10% greater than last year indicating an increased demand for energy. Only in extreme southwestern Colorado were degree day totals less than last year. Differences from average were most dramatic in midwinter when energy consumption is already high.

COLORADO CLIMATE -- OCTOBER 1983

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October is the first month of the new 1984 water year. It was marked by drier than average conditions with fairly warm temperatures over most of Colorado.

Significant Highlights -- October

Date	Event
1-3	Large low pressure trough in the upper atmosphere west of Colorado moved eastward. Warm east of mountains 1-2, cool southwest, then cooler statewide. Rain with some high elevation snows particularly over northwest Colorado. Hamilton, near Craig totalled 1.99" of rain for the period. Little Hills (Piceance Basin) received 1.17" of rain in 24 hours on the 2nd. Precipitation east of the mountains was light and widely scattered. The warmest temperature reading anywhere in the state occurred on the 2nd. Precipitation east of the mountains was light and widely scattered. The warmest temperature reading anywhere in the state occurred on the 2nd, 97°F near Campo in extreme southeastern Colorado.
4-7	Dry period. Cool on the 4th followed by above average temperatures over most of Colorado 5-7.
8-9	Large, cool high pressure system slid southeastward across the Great Plains. Warm and dry west of the mountains but sharply cooler east with scattered precipitation. Moisture was mostly light except in a narrow band from just east of Colorado Springs east-northeastward to Bonny Reservoir. Rush and Bonny Reservoir received 1.04" and 1.03" of rain on the 8th, respectively. Clearing with a return to warm weather on the 9th.
10-13	Cold front with strong upper level storm system crossed the state 10th-11th triggering precipitation over all but the southwesternmost quarter of Colorado. Precipitation again was light except in the Northern and Central Mountains where the first heavy snow of the year fell. Berthoud Pass picked up nearly a foot of snow. Cool temperatures followed the storm with readings at lower elevations mostly in the 50's and 60's during the day and upper 20's and 30's at night.

Temperatures in the mountains ranged mostly from the low 20's to the 40's.

14-15 Another storm system nipped just northwestern Colorado. Temperatures were seasonal or colder, but with moderate precipitation. Craig received 0.90" of cold rain.

16-17 Seasonally cool, mostly dry. Antero Reservoir dipped to 8°F on the 16th -- a tie with Creede for the coldest reading in the state for the month.

18-19 A new cool air mass accompanied by a weak upper level storm system moved over Colorado. Just a few scattered light rain and snow showers.

20-21 Huge moist storm system dropped torrential rains from southern New Mexico and Texas northeastward into the Midwest. Cloudiness spread over most of Colorado from this storm, but precipitation was limited to the extreme southeastern counties where up to 0.40" of rain was reported (Stonington).

22-23 Warm and dry. Temperatures in the 60's and 70's except in the higher mountains.

24-25 Cold, dry airmass briefly interrupted the mild weather. Some parts of the state experienced their coldest temperatures so far this fall. Greeley dropped to 21°F early on the 25th. Briggsdale hit 15° and Estes Park 10°.

26-31 Except for brief cooling over the Eastern Plains on the 29th and some showers on the 31st, the rest of October was warm and beautiful. Near record high temperatures for so late in the season occurred on the 27th, especially in northeastern Colorado. Fort Morgan hit 83°, Yuma 84°, Akron 85°, Julesburg 86°, and Wray 89°. Cool nighttime temperatures followed the daytime warmth. Most mornings were frosty statewide and Creede dropped to 8°F on the 27th -- tied with Antero Reservoir for the state's coldest temperature this month.

Precipitation Summary

Precipitation totals and percents of average for October appear on Figures 1 and 2. Little or no precipitation fell at a few locations including Alamosa, Bailey and Cimarron. Precipitation was less than 50% of average over most of southwestern Colorado, the Gunnison and Uncompaghre Valleys, the San Luis Valley and most of the Platte and Arkansas drainage basins. There were two wetter than average areas, however. Northwest Colorado north and west of the Colorado River was

surprisingly wet. Craig's 3.07" precipitation total was 236% of average. The 2.97" total at Hamilton was 187% of average. A second small band of greater than average October precipitation extended from just east of Colorado Springs east-northeastward to Bonny Reservoir. Rush, for example, received 1.16" of rain 204% of average. A single storm on the 8th accounted for this narrow wet band.

As we begin this new 1984 water year, statewide water supplies remain in good condition with very good carryover reservoir storage. Eastern Plains soil moisture, however, deteriorated throughout the late summer and fall months. Current winter wheat conditions are rated only as fair. November through February precipitation on the plains is normally very sparse, so significant changes in moisture conditions are not likely until spring in these areas.

Temperature Summary

Figure 3 shows October temperatures and departures from average for a number of Colorado locations. Most of the state was one to three degrees Fahrenheit warmer than average. Grand Junction's 58.2° monthly mean temperature was the warmest in Colorado, 3.3 degrees above average. A few locations were a little cooler than average including Burlington, Canon City, Buena Vista and Alamosa.

Degree Days

This is the time of year when high heating bills make us very sensitive to energy consumption and conservation. Heating degree days are an excellent simple tool for comparing climatic conditions with energy consumption.

Table 1 contains heating degree day information for a number of Colorado cities. Heating degree totals ranged from about 3% above average for Alamosa, Buena Vista, and Canon City to as much as 36% below average at Grand Junction. Most of the state was between 5% and 20% below average. Differences were even greater when compared to October 1982 which was an unusually chilly month. As a result, most consumers should have required less fuel for heating than a year ago.

Figure 1. October 1983 precipitation amounts.

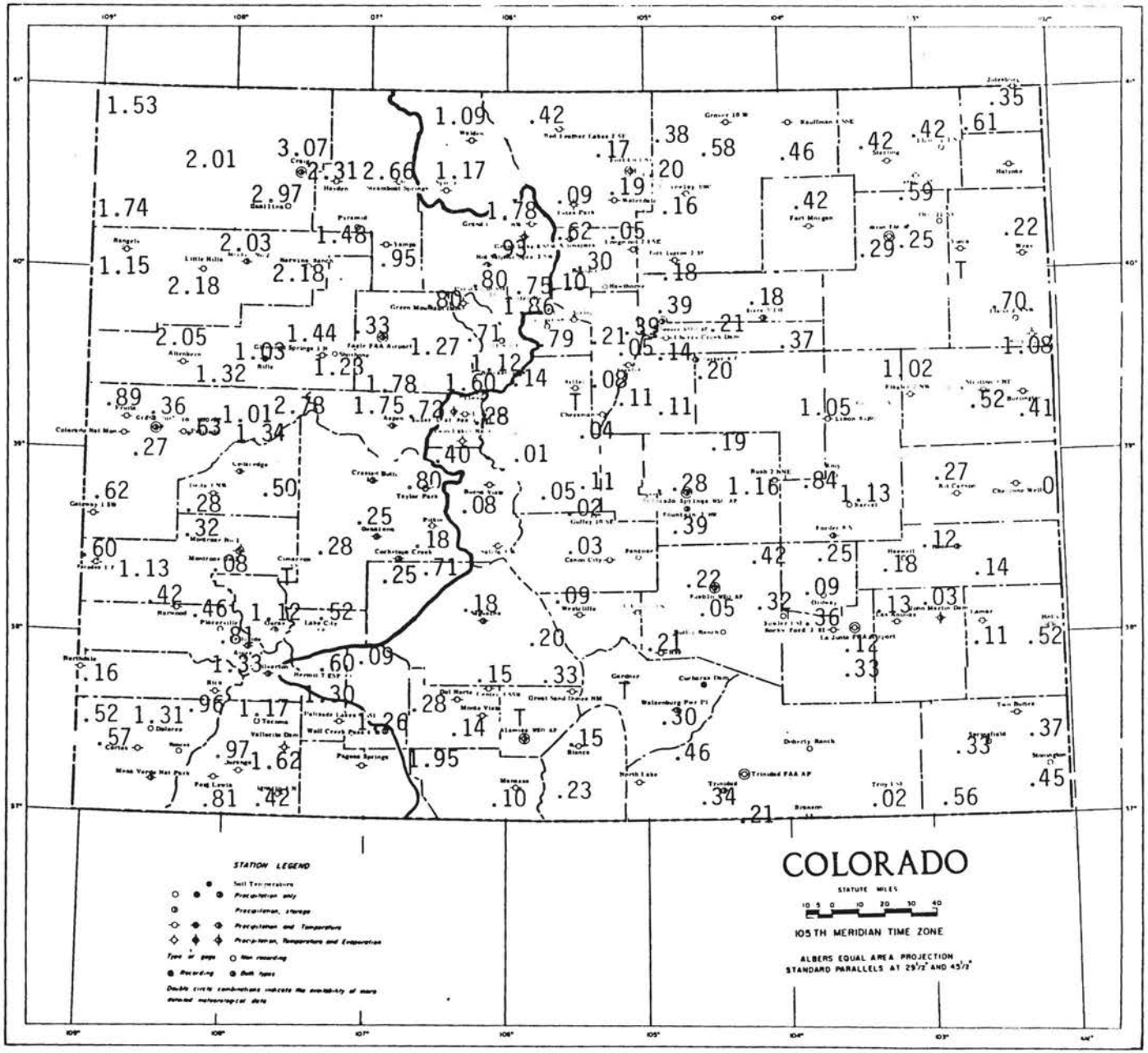


Figure 2. Precipitation for October 1983 as a percent of the 1951-1980 average.

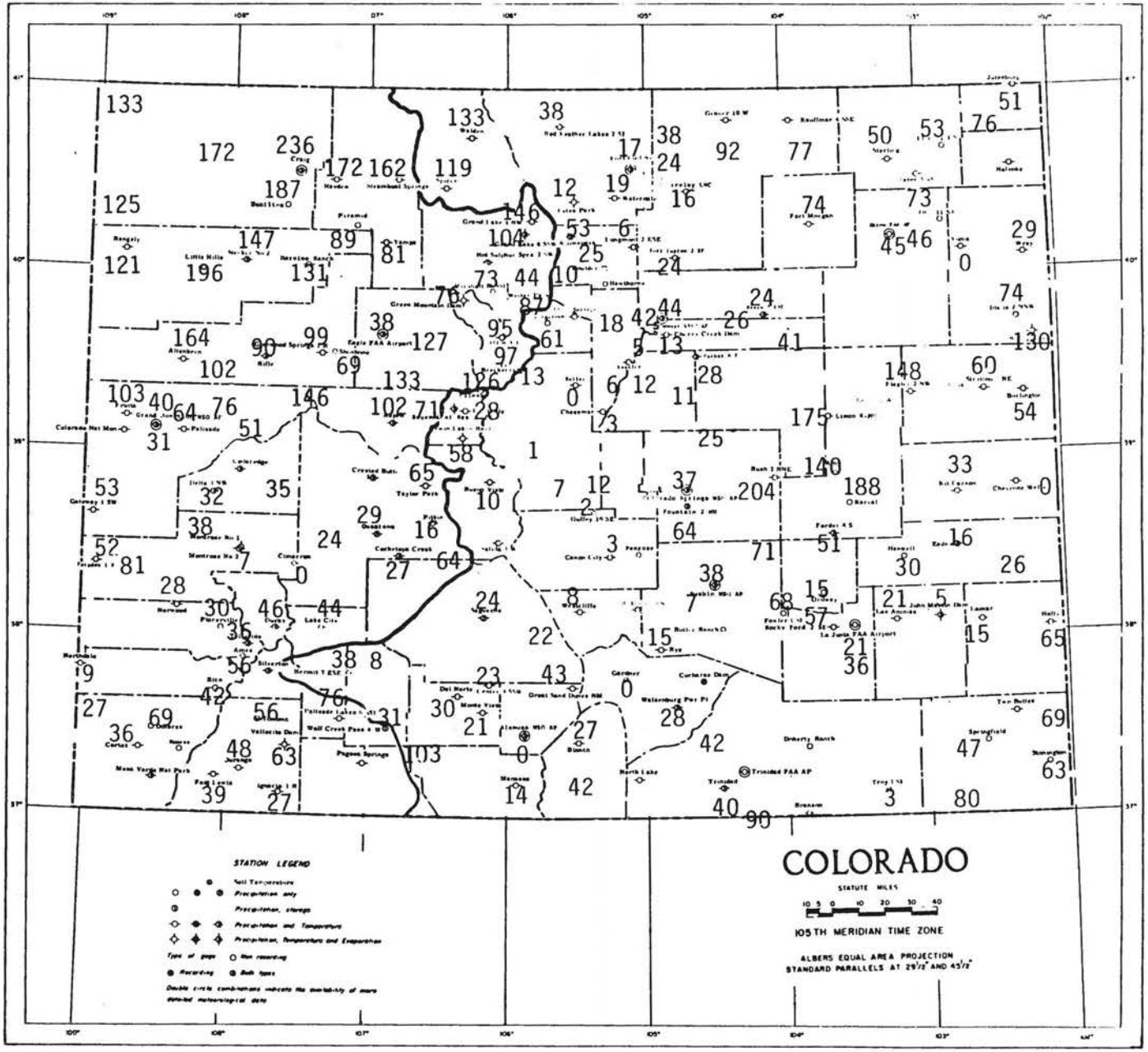


Figure 3. Temperatures for October 1983 in degrees Fahrenheit (in parentheses) and departures from the 1961-1980 average.

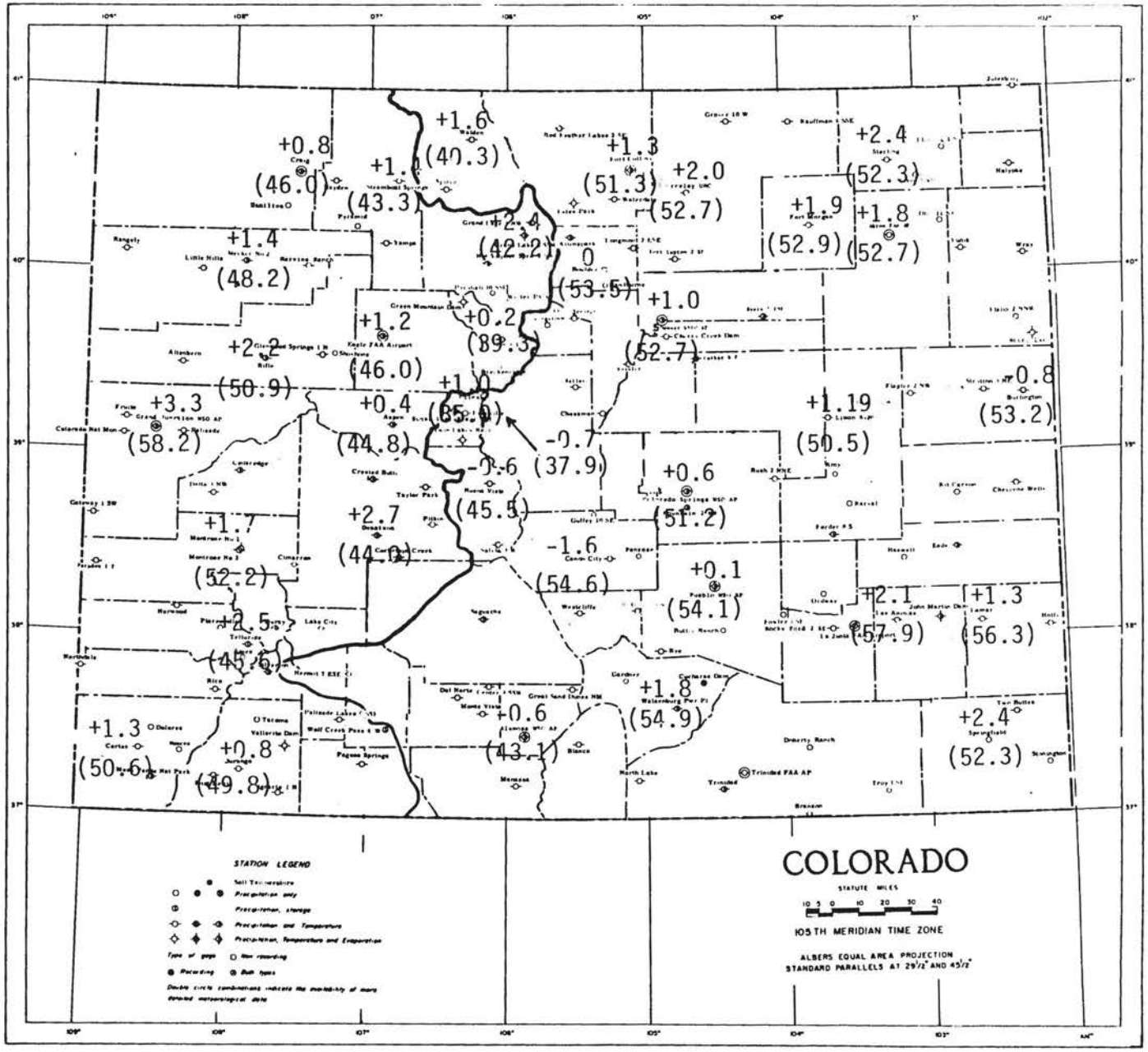


Table 1. Colorado Heating Degree Day Data through October 1983.

HEATING DEGREE DATA

STATION		JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	ANN
ALAMOSA	AVE	40	100	303	657	1074	1457	1519	1182	1035	732	453	165	8717
	82-83	59	47	274	714	1016	1361	1380	1080	945	856	556	249	8537
	83-84	28	35	213	674									950
ASPEN	AVE	95	150	348	651	1029	1339	1376	1162	1116	798	524	262	8850
	82-83	148	119	262	808	1105	1326	1301	1095	1066	959	691	350	9330
	83-84	97	86	269	622									1074
BOULDER	AVE	0	6	130	357	714	908	1004	804	775	483	220	59	5460
	82-83	4	0	154	442	769	913	963	819	811	639	380	120	6014
	83-84	4	0	84	350									438
BUENA VISTA	AVE	47	116	285	577	936	1184	1218	1025	983	720	459	184	7734
	82-83	47	70	284	745	798	1160	1105	995	990	897	547	266	7904
	83-84	45	49	234	595									923
BURLING-TON	AVE	6	5	108	364	762	1017	1110	871	803	459	200	38	5743
	82-83	0	5	99	405	818	999	1006	784	832	637	339	81	6005
	83-84	0	0	87	359									446
CANON CITY	AVE	0	9	81	301	639	831	911	734	707	411	179	33	4936
	82-83	3	6	109	391	745	890	829	711	726	579	302	85	5376
	83-84	0	0	71	314									385
COLORADO SPRINGS	AVE	8	25	162	440	819	1042	1122	910	880	564	296	78	6346
	82-83	8	11	198	532	880	1084	1001	851	904	742	444	159	6814
	83-84	2	0	101	417									520
CORTEZ	AVE	0	11	115	434	813	1132	1181	921	828	555	292	68	6350
	82-83	17	5	132	606	856	1148	1168	939	878	723	438	131	7041
	83-84	5	0	98	439									541
CRAIG	AVE	32	58	275	609	996	1342	1479	1193	1094	687	419	193	8376
	82-83	37	5	271	752	1116	1361	1305	1130	989	847	561	228	8602
	83-84	41	3	212	579									835
DELTA	AVE	0	0	94	394	813	1135	1197	890	753	429	167	31	5903
	82-83	2	4	81	496	777	1043	1040	753	686	513	272	66	5733
	83-84	0	0	60	340									400
DENVER	AVE	0	0	135	414	789	1004	1101	879	837	528	253	74	6014
	82-83	3	0	151	497	875	1050	1017	789	885	712	419	129	6517
	83-84	3	0	87	372									462
DILLON	AVE	273	332	513	806	1167	1435	1516	1305	1296	972	704	435	10754
	82-83	318	253	511	959	1235	1450	1418	1265	1227	1158	842	496	11132
	83-84	263	224	438	789									1714
DURANGO	AVE	9	34	193	493	837	1153	1218	958	862	600	366	125	6848
	82-83	24	6	175	614	874	1197	1130	909	850	735	405	147	7066
	83-84	3	0	124	464									591
EAGLE	AVE	33	80	288	626	1026	1407	1448	1148	1014	705	431	171	8377
	82-83	54	21	257	720	1059	1350	1273	974	880	846	529	219	8192
	83-84	30	3	203	579									815
EVER-GREEN	AVE	59	113	327	621	916	1135	1199	1011	1009	730	489	218	7827
	82-83	110	41	339	733	1032	1184	940	979	1056	961	694	324	8393
	83-84	72	15	228	605									920
FORT COLLINS	AVE	5	11	171	468	846	1073	1181	930	877	558	281	82	6483
	82-83	4	0	178	509	925	1082	968	787	830	715	389	127	6514
	83-84	2	0	115	415									532
FORT MORGAN	AVE	0	6	140	433	867	1156	1283	969	874	516	224	47	6520
	82-83	3	3	123	492	895	1036	1050	804	798	663	346	108	6371
	83-84	0	0	77	368									445
GRAND JUNCTION	AVE	0	0	65	325	762	1138	1225	882	716	403	148	19	5683
	82-83	2	0	61	397	704	983	946	668	586	482	239	22	5090
	83-84	0	0	27	208									235

HEATING DEGREE DATA

STATION		JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	ANN
GRAND LAKE	AVE	214	264	469	775	1128	1473	1593	1369	1318	951	654	384	10591
	82-83	254	180	452	878	1236	1505	1489	1280	1219	1157	803	443	10996
	83-84	233	156	400	703									1492
GREELEY	AVE	0	0	149	450	861	1128	1240	946	856	522	238	52	6442
	82-83	5	0	154	478	888	1075	983	770	806	688	379	113	6311
	83-84	3	0	72	375									450
GUNNISON	AVE	111	188	393	719	1119	1590	1714	1422	1231	816	543	276	10122
	82-83	132	89	374	778	1146	1394	1379	1118	990	925	612	318	9255
	83-84	75	60	299	641									1075
LAS ANIMAS	AVE	0	0	45	296	729	998	1101	820	698	348	102	9	5136
	82-83	0	0	43	313	753	979	1012	747	682	491	198	19	5239
	83-84	0	0	25	222									247
LEAD-VILLE	AVE	272	337	522	817	1173	1435	1473	1318	1320	1038	726	439	10970
	82-83		323	540	974	1260	1426	1399	1259	1301	1220	806	544	11132
	83-84	308	316	488	832									1344
LIMON	AVE	8	6	144	448	831	1070	1156	960	936	570	299	100	6531
	82-83	18	5	184	539	936	1124	1077	898	935	792	464	166	7139
	83-84	7	0	109	442									558
LONGMONT	AVE	0	6	162	453	843	1082	1194	938	874	546	256	78	6132
	82-83	7	0	164	517	894	1087	1001	809	836	664	406	128	6513
	83-84	1	0	91	382									474
MEEKER	AVE	28	56	261	564	927	1240	1345	1096	999	651	394	164	7714
	82-83	33	7	245	657	998	1225	1157	1010	901	806	488	199	7736
	83-84	12	2	145	512									671
MONTROSE	AVE	0	10	135	437	837	1159	1218	941	818	527	254	69	6300
	82-83	4	2	111	556	846	1104	1094	828	759	620	347	89	6360
	83-84	0	0	73	390									463
PAGOSA SPRINGS	AVE	82	113	297	608	981	1305	1380	1123	1026	732	487	233	8367
	82-83	76	29	253	732	933	1338	1274	1013	943	919	565	296	8266
	83-84	51	10	190										251
PUEBLO	AVE	0	0	89	346	744	998	1091	834	756	421	163	23	5465
	82-83	0	0	63	427	794	1010	974	833	740	561	258	50	5719
	83-84	0	0	52	330									382
RIFLE	AVE	6	24	177	499	876	1249	1321	1002	856	555	298	82	6945
	82-83	8	3	150	596	871	1129	1082	833	738	669	394	107	6590
	83-84	3	0	86	430									519
STEAMBOAT SPRINGS	AVE	113	169	390	704	1101	1476	1541	1277	1184	810	533	297	9595
	82-83	146	80	368	791	1183	1482	1446	1146	1024	939	618	333	9556
	83-84	120	61	334	663									1178
STERLING	AVE	0	6	157	462	876	1163	1274	966	896	528	235	51	6614
	82-83	3	3	154	518	933	1098	1046	762	827	674	363	111	6492
	83-84	1	0	98	392									491
TELLURIDE	AVE	163	223	396	676	1026	1293	1339	1151	1141	849	589	318	9164
	82-83	139	140	364	746	1022	1265	1195	1042	1036	956	620	355	8980
	83-84	108	130	288	597									1123
TRINIDAD	AVE	0	0	86	359	738	973	1051	846	781	468	207	35	5544
	82-83	0	0	66	367	705	949	956	779	730	619	318	66	5555
	83-84	0	0	55										55
WALDEN	AVE	198	285	501	822	1170	1457	1535	1313	1277	915	642	351	10466
	82-83	201	141	469	878	1242	1441	1396	1173	1122	1052	761	391	10267
	83-84	156	114	237	759									1416
WALSEN-BURG	AVE	0	8	102	370	720	924	989	820	791	501	210	49	5504
	82-83	0	1	95	400	714	927	920	719	763	627	313	92	5432
	83-84	0	0	87	310									397

Table 2. Colorado Cooling Degree Day Data through October 1983.

COOLING DEGREE DATA

STATION		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
ALAMOSA	AVE	0	0	0	0	0	9	40	20	0	0	0	0	69
	1982	0	0	0	0	0	0	38	27	0	0	0	0	65
	1983	0	0	0	0	0	4	43	30	1	0			78
ASPEN	AVE	0	0	0	0	0	7	18	11	0	0	0	0	36
	1982	0	0	0	0	0	0	6	2	0	0	0	0	8
	1983	0	0	0	0	0	0	11	13	1	0			25
BOULDER	AVE	0	0	0	0	22	155	283	220	94	16	0	0	790
	1982	0	0	0	0	3	30	222	246	52	0	0	0	553
	1983	0	0	0	0	17	52	249	309	98	0			725
BUENA VISTA	AVE	0	0	0	0	0	13	37	26	0	0	0	0	76
	1982	0	0	0	0	0	7	36	22	0	0	0	0	65
	1983	0	0	0	0	0	1	39	22	2	0			64
BURLING-TON	AVE	0	0	0	0	26	179	325	253	93	11	0	0	887
	1982	0	0	0	0	9	61	316	310	94	2	0	0	792
	1983	0	0	0	0	15	109	360	420	135	1			1040
CANON CITY	AVE	0	0	0	0	33	183	329	266	93	15	0	0	919
	1982	0	0	0	0	12	62	326	289	88	0	0	0	777
	1983	0	0	0	0	10	88	336	328	135	0			897
COLORADO SPRINGS	AVE	0	0	0	0	8	99	200	149	45	0	0	0	501
	1982	0	0	0	0	0	23	176	127	26	0	0	0	352
	1983	0	0	0	0	1	48	236	219	71	0			575
CORTEZ	AVE	0	0	0	0	6	77	214	154	22	0	0	0	473
	1982	0	0	0	0	0	29	143	154	31	0	0	0	357
	1983	0	0	0	0	7	22	150	169	46	0			394
CRAIG	AVE	0	0	0	0	0	13	82	49	8	0	0	0	152
	1982	0	0	0	0	0	11	84	106	8	0	0	0	209
	1983	0	0	0	0	0	7	83	134	17	0			241
DELTA	AVE	0	0	0	0	21	115	282	208	52	0	0	0	678
	1982	0	0	0	0	13	120	268	274	51	0	0	0	726
	1983	0	0	0	0	14	74	263	328	121	0			800
DENVER	AVE	0	0	0	0	11	134	261	203	63	8	0	0	680
	1982	0	0	0	0	6	42	247	257	59	0	0	0	611
	1983	0	0	0	0	7	69	264	301	91	0			732
DILLON	AVE	0	0	0	0	0	0	0	0	0	0	0	0	0
	1982	0	0	0	0	0	0	0	0	0	0	0	0	0
	1983	0	0	0	0	0	0	0	0	0	0			0
DURANGO	AVE	0	0	0	0	0	20	111	71	7	0	0	0	209
	1982	0	0	0	0	0	10	114	122	15	0	0	0	261
	1983	0	0	0	0	1	9	159	152	24	0			345
EAGLE	AVE	0	0	0	0	0	9	71	39	0	0	0	0	119
	1982	0	0	0	0	0	6	49	65	0	0	0	0	120
	1983	0	0	0	0	0	1	65	112	9	0			187
EVER-GREEN	AVE													
	1982	0	0	0	0	0	2	18	14	0	0	0	0	34
	1983	0	0	0	0	0	0	28	25	8	0			61
FORT COLLINS	AVE	0	0	0	0	5	100	204	132	30	0	0	0	471
	1982	0	0	0	0	1	28	202	214	25	0	0	0	470
	1983	0	0	0	0	8	56	220	281	51	0			616
FORT MORGAN	AVE	0	0	0	0	16	155	304	223	62	0	0	0	760
	1982	0	0	0	4	17	78	325	319	82	0	0	0	825
	1983	0	0	0	0	17	97	341	424	144	1			1024
GRAND JUNCTION	AVE	0	0	0	0	58	238	431	338	128	12	0	0	1205
	1982	0	0	0	0	33	229	443	415	144	0	0	0	1264
	1983	0	0	0	0	49	171	422	483	226	3			1354

COOLING DEGREE DATA

STATION		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
GRAND LAKE	AVE	0	0	0	0	0	0	0	0	0	0	0	0	0
	1982	0	0	0	0	0	0	0	0	0	0	0	0	0
	1983	0	0	0	0	0	0	0	156	0	0			156
GREELEY	AVE	0	0	0	0	15	130	267	185	50	0	0	0	647
	1982	0	0	0	4	3	41	232	259	42	0	0	0	581
	1983	0	0	0	0	5	83	257	319	65	0			729
GUNNISON	AVE	0	0	0	0	0	0	9	9	0	0	0	0	18
	1982	0	0	0	0	0	0	11	1	0	0	0	0	12
	1983	0	0	0	0	0	0	16	16	0	0			32
LAS ANIMAS	AVE	0	0	0	6	53	270	425	344	120	8	0	0	1226
	1982	0	0	0	8	62	145	376	412	133	5	0	0	1141
	1983	0	0	0	6	34	201	516	512	256	11			1536
LEAD-VILLE	AVE	0	0	0	0	0	0	0	0	0	0	0	0	0
	1982	0	0	0	0	0	0	0	0	0	0	0	0	0
	1983	0	0	0	0	0	0	0	0	0	0			0
LIMON	AVE	0	0	0	0	8	97	206	159	39	8	0	0	516
	1982	0	0	0	0	0	17	174	193	36	0	0	0	420
	1983	0	0	0	0	1	36	215	239	76	0			567
LONGMONT	AVE	0	0	0	0	8	117	227	158	45	0	0	0	555
	1982	0	0	0	1	11	43	216	257	62	0	0	0	590
	1983	0	0	0	0	11	82	263	315	89	0			760
MEEKER	AVE	0	0	0	0	0	14	87	49	12	0	0	0	162
	1982	0	0	0	0	0	13	87	88	2	0	0	0	190
	1983	0	0	0	0	0	2	79	127	21	0			229
MONTROSE	AVE	0	0	0	0	12	120	242	162	45	0	0	0	581
	1982	0	0	0	0	4	84	246	224	43	0	0	0	601
	1983	0	0	0	0	11	80	233	240	88	0			652
PAGOSA SPRINGS	AVE	0	0	0	0	0	8	51	27	0	0	0	0	86
	1982	0	0	0	0	0	0	42	50	0	0	0	0	92
	1983	0	0	0	0	0	2	35	42	11	0			90
PUEBLO	AVE	0	0	0	0	39	212	369	295	119	8	0	0	1042
	1982	0	0	0	3	30	123	395	369	110	0	0	0	1029
	1983	0	0	0	0	16	120	391	391	149	0			1067
RIFLE	AVE	0	0	0	0	0	46	167	117	15	0	0	0	345
	1982	0	0	0	0	0	38	193	205	14	0	0	0	450
	1983	0	0	0	0	0	29	178	249	57	0			513
STEAMBOAT SPRINGS	AVE	0	0	0	0	0	0	11	7	0	0	0	0	18
	1982	0	0	0	0	0	0	12	10	0	0	0	0	22
	1983	0	0	0	0	0	0	3	21	2	0			26
STERLING	AVE	0	0	0	0	15	147	293	214	52	0	0	0	721
	1982	0	0	0	0	3	51	268	279	53	0	0	0	654
	1983	0	0	0	0	12	84	301	398	101	2			898
TELLURIDE	AVE	0	0	0	0	0	0	0	0	0	0	0	0	0
	1982	0	0	0	0	0	0	3	2	0	0	0	0	5
	1983	0	0	0	0	0	0	2	1	0	0			3
TRINIDAD	AVE	0	0	0	0	18	155	279	216	68	5	0	0	741
	1982	0	0	0	3	12	93	306	257	95	0	0	0	756
	1983	0	0	0	0	1	100	327	319	167				914
WALDEN	AVE	0	0	0	0	0	0	0	0	0	0	0	0	0
	1982	0	0	0	0	0	0	2	0	0	0	0	0	2
	1983	0	0	0	0	0	0	1	2	0	0			3
WALSEN-BURG	AVE	0	0	0	0	8	109	219	157	45	0	0	0	533
	1982	0	0	0	1	1	30	250	211	65	0	0	0	558
	1983	0	0	0	0	2	67	[illegible]	[illegible]	[illegible]	2			[illegible]

COLORADO CLIMATE -- NOVEMBER 1983

Colorado Climate Center
Department of Atmospheric Science
Fort Collins, Colorado 80523

November saw an abrupt change from mild and dry autumn weather early in the month to winter in its fullest fury. Record or near record precipitation and snow fell at many stations, and all but portions of southeastern Colorado were much wetter than average.

Significant Highlights -- November

Date	Event
1-7	Very warm with little precipitation statewide. The warmest days were the 1st, 4th and the 7th when temperatures all across the state approached record high values (mostly 70's with a few 80's at lower elevations and 50's and 60's in the mountains). Aspen and Steamboat Springs both reached 66°F on the 4th. Pueblo and Springfield hit 80° on the 7th. The warmest reading in the state for November was 84°occurring near Wray and at Holly on the 1st. Weak Pacific cold front crossed Colorado on the 5th bringing with it briefly cooler temperatures and a few showers.
8-10	An abrupt drop in temperatures as a strong low pressure center developed over southern Colorado early on the 8th. The first measurable snow of the winter fell on many lower elevation areas east of the mountains. The storm produced plenty of precipitation over much of the state excluding the San Luis Valley. Nearly an inch of rain fell in the vicinity of Grand Junction with a foot or more of snow in several mountain areas. Precipitation ended on the 9th but cold temperatures lingered with morning readings in the teens across most of eastern Colorado and some subzero mountain temperatures, the first of the winter.
11-17	High pressure ridge aloft over the central Rocky Mountain states prevailed, although several disturbances passed through. Temperatures were mostly near or above average. Little or no precipitation fell east of the mountains, but moisture laden Pacific air dumped heavy snows particularly on the Northern and Central mountains 12-14. Berthoud Pass, for example, received 18" of snow for the period including 1.37" of water equivalent in a 24-hour period.

18-30 Very stormy, cold, wintry period across Colorado. Three major winter storm events occurred with intermittent mountain snows continuing between the storms.

18-19 Relatively warm temperatures as storm began. Rain or rain and snow mixed at elevations below 7,000. Spotty heavy precipitation amounts: Alamosa 0.52", Walsenburg 1.00" (9" snow), and Ouray 1.44" (19" snow), while some areas east of the mountains were missed completely.

20-22 Major storm center crossed southern Colorado followed by very cold temperatures. Most of Colorado received some precipitation, but heavy precipitation was limited to the immediate mountain areas. Wolf Creek Pass measured 2.34" of precipitation from the storm (39" snow). Temperatures plummeted where skies cleared after the storm. Creede had the state's coldest official temperature for November, -28°F on the morning of the 23rd. Antero Reservoir was close behind with -24°.

25-27 Large Pacific storm system crossed into southern Colorado and strengthened as it incorporated copious Gulf of Mexco moisture. Warm temperatures and strong winds occurred east of the mountains in advance of the storm on the 25th. Akron and Rocky Ford, for example, hit 64° and 69°, respectively. Major snowstorm then developed statewide as cold air surged southward into the state. It was a fairly minor winter storm in the mountains and western valleys, but on the eastern plains it turned into a life-threatening blizzard as very strong winds and temperatures below 20°F accompanied the snow from late on the 26th on through the 27th. Because of the high winds and fairly dry snow, observers had difficulty making accurate measurements. Overall, the area of the heaviest snowfall was remarkably similar to the infamous Christmas Eve storm just 11 months ago. It extended from the foothills southwest of Denver on across the metropolitan area eastward to Limon and northeastward down the Platte Valley. Some of the greatest snowfall totals for the storm included: Castle Rock 24", Limon 23.7", Denver 21.5", Sterling and Boulder 19", Fort Morgan 18". Another area of heavy snow extended eastward from the foothills west of Trinidad on across the higher land south of the Arkansas River. Trinidad and Walsenburg, for example, each reported 18" of snow while Pueblo's total was only 1.3".

The storm was followed by cold weather and another much weaker storm on the 29th which added 3" of snow at Fort Collins, 4" at Sterling and considerably more in the Northern Mountains. Temperatures dipped below 0°F over portions of the Eastern Plains on the morning of the 30th. Denver hit -7° and New Raymer dropped to -14°. Strong low level temperature inversions were responsible for a serious air pollution episode which began at the end of the month.

Precipitation Summary

Precipitation totals and percents of average for November appear in Figures 1 and 2. It was an exceptionally wet month across broad areas of Colorado with several new records being set. Except for a few isolated points, areas west of the Continental Divide, the eastern foothills and the northeastern plains of Colorado all received more than double the average November precipitation. Some new record precipitation amounts included 5.28" at Steamboat Springs (292% of average), 4.02" at Pitkin (341% of average) and 7.67" at Berthoud Pass (91.5" of snow). The wettest reporting station for November was Bonham Reservoir where 7.75" of precipitation fell, nearly 3 times their normal.

As always there were a few areas with near or below average precipitation. These areas included the north central portion of the San Luis Valley and local portions of the upper and lower Arkansas Valley. The driest reporting stations were the John Martin Dam and Ordway with 0.09 and 0.16" of precipitation, respectively.

Water-Year Precipitation to Date

Accumulated precipitation as a percent of average for the first 2 months of the 1984 water year is shown in Figure 3. The wet November quickly made up for dry October conditions in all but extreme southeastern Colorado. The Yampa and North Platte drainages are the wettest in the state compared to average.

Temperature Summary

With a warm first part of November and cold weather later in the month, statewide temperatures ended up very close to average. Denver, Alamosa and Durango were the coldest reporting stations compared to average, 1.8, 2.2 and 2.6 degrees below average, respectively. Grand Junction, Sterling and Limon were the warmest locations compared to average, just less than 2 degrees above average.

Degree Days

Heating degree day information is printed in Table 1. For the most part, stations were within 10% of the 1951-1980 average for November. However, totals this year were less than a year ago for most locations, indicating a little less demand this year for energy to heat schools, homes, and businesses.

Merry Christmas Everybody

The staff of the Colorado Climate Center would like to share holiday greetings with you at this special time of year.

Merry Christmas and Happy New Year!

Dr. Tom McKee	State Climatologist
Nolan Doesken	Assistant State Climatologist
Odie Panella	Secretary
Patti Fylling	Office Assistant
John Kleist	Computer Programmer

Figure 1. November 1983 precipitation amounts.

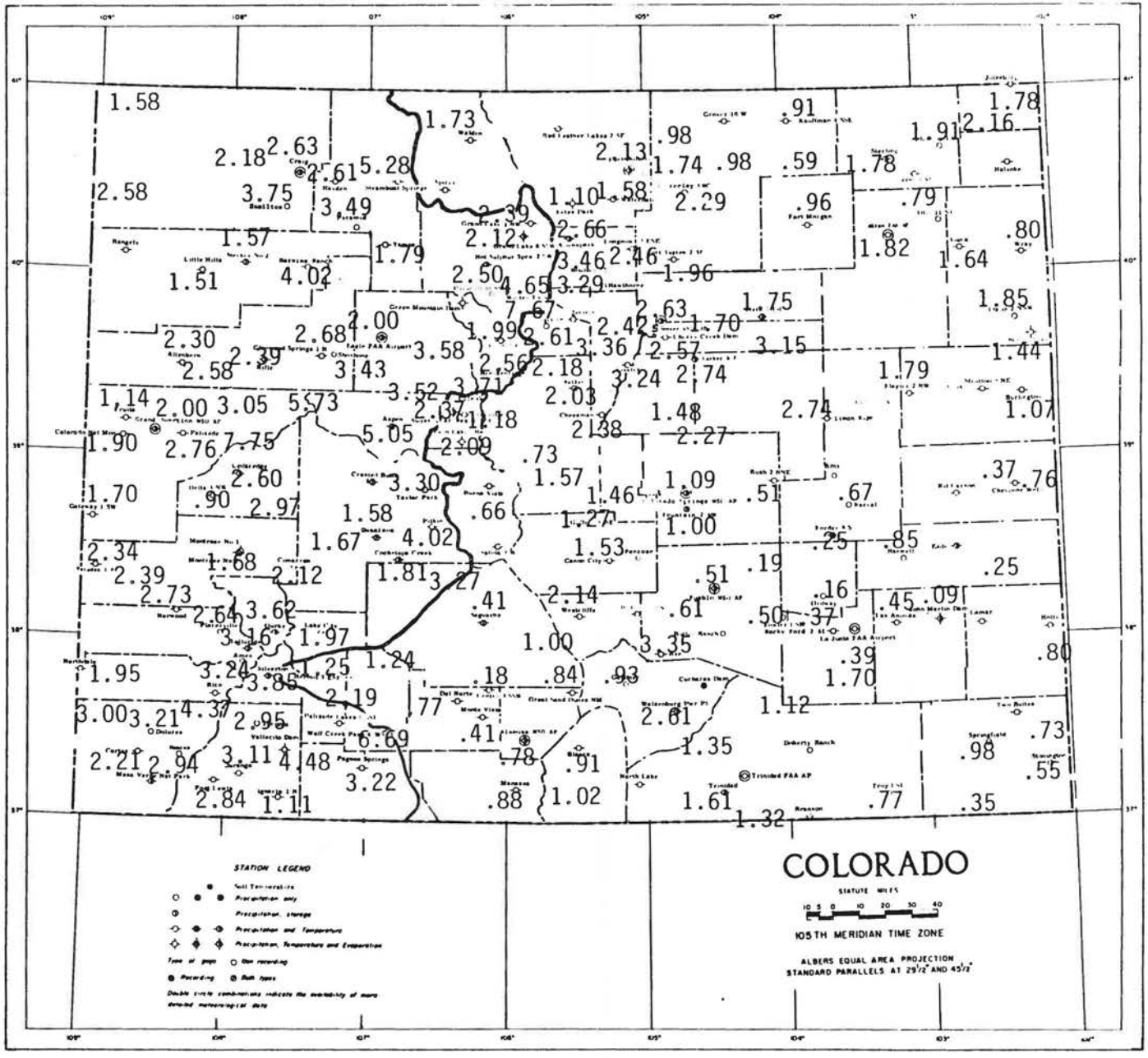


Figure 2. Precipitation for November 1983 as a percent of the 1961-1980 average.

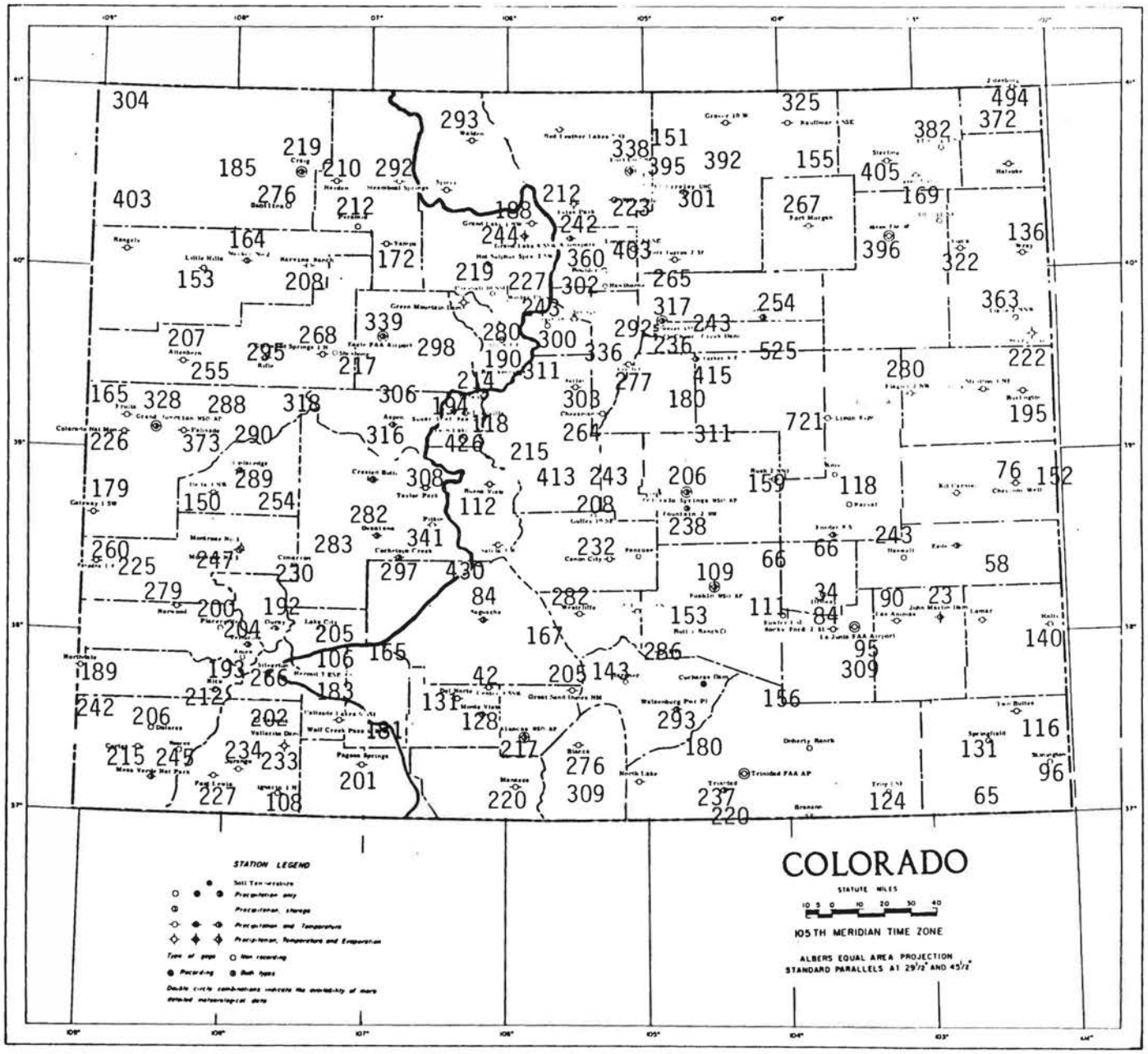


Figure 3. Precipitation for October-November 1983 as a percent of the 1961-1980 average.

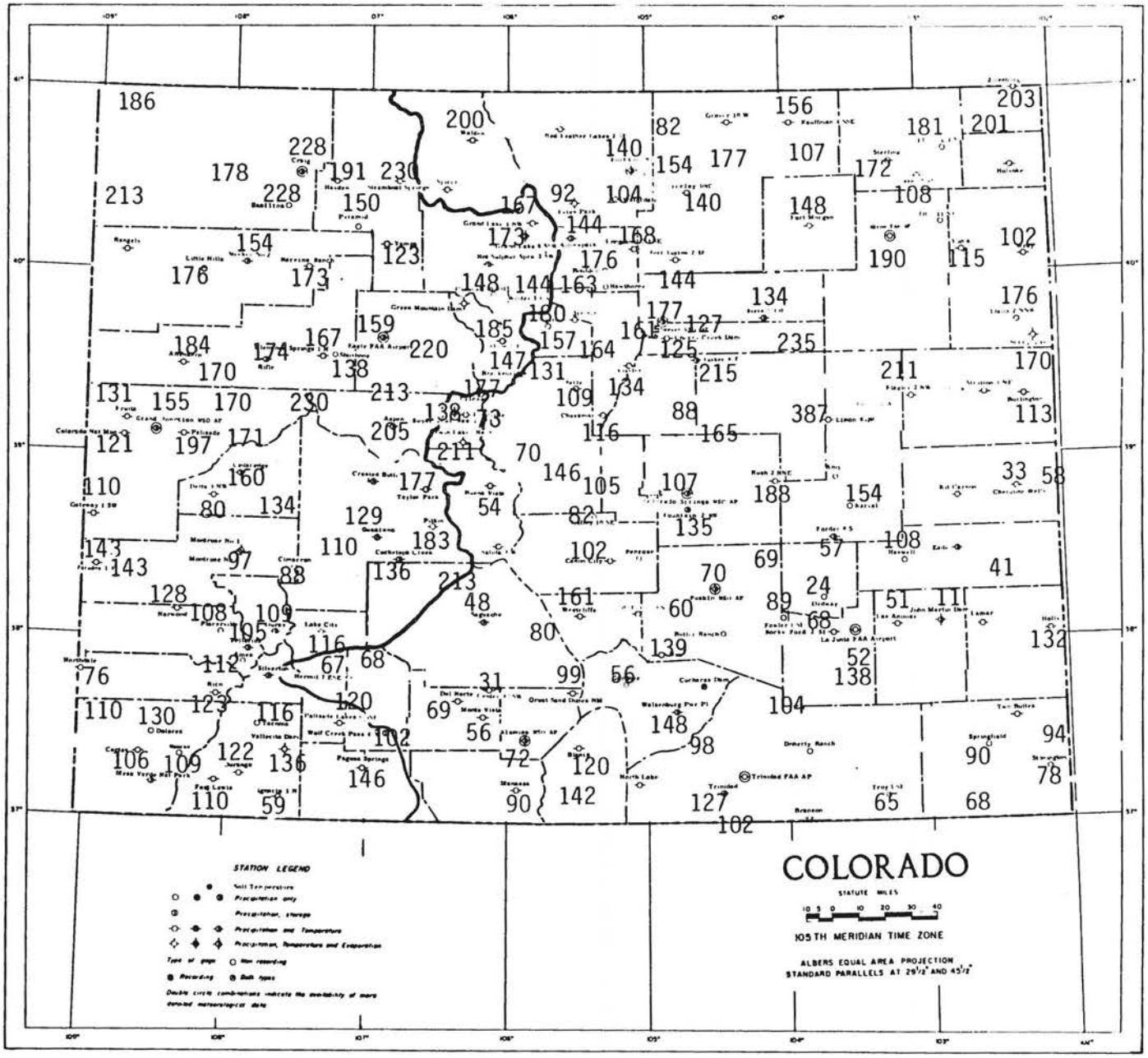


Figure 4. Temperatures for November 1983 in degrees Fahrenheit (in parentheses) and departures from the 1961-1980 average.

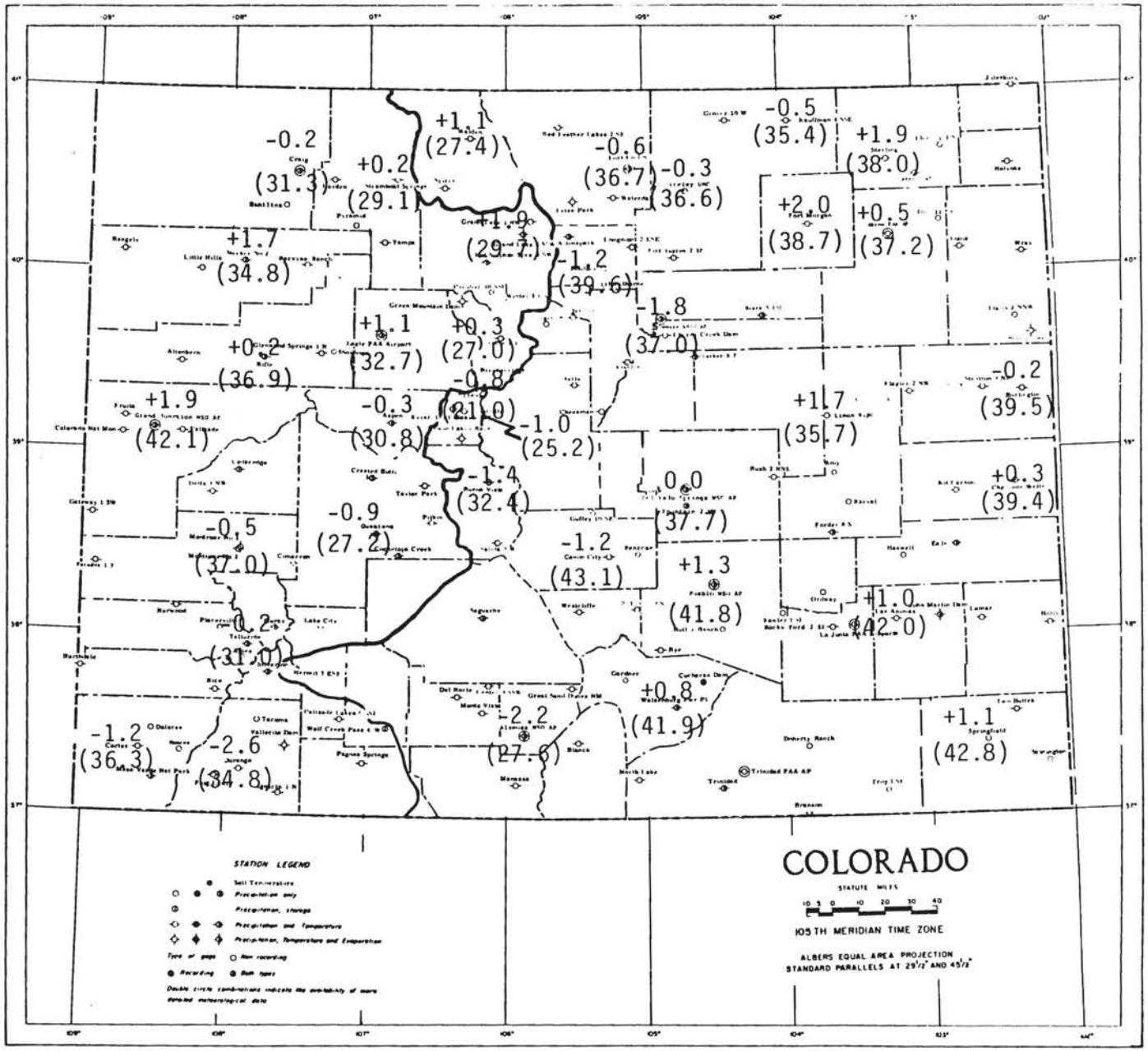


Table 1. Colorado Heating Degree Day Data through November 1983.

HEATING DEGREE DATA

STATION		JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	ANN
ALAMOSA	AVE	40	100	303	657	1074	1457	1519	1182	1035	732	453	165	8717
	82-83	59	47	274	714	1016	1361	1380	1080	945	856	556	249	8537
	83-84	28	35	213	674	1112								2062
ASPEN	AVE	95	150	348	651	1029	1339	1376	1162	1116	798	524	262	8950
	82-83	148	119	362	808	1105	1326	1301	1095	1066	959	691	350	9330
	83-84	97	86	269	622	1021								2095
BOULDER	AVE	0	6	130	357	714	908	1004	804	775	483	220	59	5460
	82-83	4	0	154	442	769	913	963	819	811	639	380	120	6014
	83-84	4	0	84	350	753								1191
BUENA VISTA	AVE	47	116	285	577	936	1184	1218	1025	983	720	459	184	7734
	82-83	47	70	284	745	798	1160	1105	995	990	897	547	266	7904
	83-84	45	49	234	595	970								1893
BURLING-TON	AVE	6	5	108	364	762	1017	1110	871	803	459	200	38	5743
	82-83	0	5	99	405	818	999	1006	784	832	637	339	81	6005
	83-84	0	0	87	359	758								1204
CANON CITY	AVE	0	9	81	301	639	831	911	734	707	411	179	33	4836
	82-83	3	6	109	391	745	890	829	711	726	579	302	85	5376
	83-84	0	0	71	314	649								1034
COLORADO SPRINGS	AVE	8	25	162	440	819	1042	1122	910	880	564	296	78	6346
	82-83	8	11	198	532	880	1084	1001	851	904	742	444	159	6814
	83-84	2	0	101	417	811								1331
CORTEZ	AVE	0	11	115	434	813	1132	1181	921	828	555	292	68	6350
	82-83	17	5	132	606	856	1148	1168	939	878	723	438	131	7041
	83-84	5	0	98	438	854								1395
CRAIG	AVE	32	58	275	608	996	1342	1479	1193	1094	687	419	193	8376
	82-83	37	5	271	752	1116	1361	1305	1130	989	847	561	228	8602
	83-84	41	3	212	579	1005								1840
DELTA	AVE	0	0	94	394	813	1135	1197	890	753	429	167	31	5903
	82-83	2	4	81	496	777	1043	1040	753	686	513	272	66	5733
	83-84	0	0	60	340	727								1127
DENVER	AVE	0	0	135	414	789	1004	1101	879	837	528	253	74	6014
	82-83	3	0	151	487	875	1050	1017	789	885	712	419	129	6517
	83-84	3	0	87	372	833								1295
DILLON	AVE	273	332	513	806	1167	1435	1516	1305	1296	972	704	435	10754
	82-83	318	253	511	959	1235	1450	1418	1265	1227	1158	842	496	11132
	83-84	263	224	438	789	1135								2849
DURANGO	AVE	9	34	193	493	837	1153	1218	958	862	600	366	125	6848
	82-83	24	6	175	614	874	1197	1130	909	850	735	405	147	7066
	83-84	3	0	124	464	899								1490
EAGLE	AVE	33	80	288	626	1026	1407	1448	1148	1014	705	431	171	8377
	82-83	54	21	257	720	1059	1350	1273	974	880	846	529	219	8182
	83-84	30	3	203	579	962								1777
EVER-GREEN	AVE	59	113	327	621	916	1135	1199	1011	1009	730	489	218	7827
	82-83	110	41	339	733	1032	1184	940	979	1056	961	694	324	8393
	83-84	72	15	228	605	971								1891
FORT COLLINS	AVE	5	11	171	468	846	1073	1181	930	877	558	281	82	6483
	82-83	4	0	178	509	925	1082	968	787	830	715	389	127	6514
	83-84	2	0	115	415	843								1375
FORT MORGAN	AVE	0	6	140	438	867	1156	1283	969	874	516	224	47	6520
	82-83	3	3	123	492	895	1086	1050	804	798	663	346	108	6371
	83-84	0	0	77	368	782								1227
GRAND JUNCTION	AVE	0	0	65	325	762	1138	1225	882	716	403	148	19	5683
	82-83	2	0	61	397	704	983	946	668	586	482	239	22	5090
	83-84	0	0	27	208	678								913

HEATING DEGREE DATA

STATION		JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	ANN
GRAND LAKE	AVE	214	264	468	775	1128	1473	1593	1369	1318	951	654	384	10591
	82-83	254	180	452	878	1236	1505	1489	1280	1219	1157	803	443	10896
	83-84	233	156	400	703	1052								2544
GREELEY	AVE	0	0	149	450	861	1128	1240	946	856	522	238	52	6442
	82-83	5	0	154	478	888	1075	988	770	806	688	379	113	6344
	83-84	3	0	72	375	843								1293
GUNNISON	AVE	111	188	393	719	1119	1590	1714	1422	1231	816	543	276	10122
	82-83	132	89	374	778	1146	1394	1379	1118	990	925	612	318	9255
	83-84	75	60	299	641	1128								2203
LAS ANIMAS	AVE	0	0	45	296	729	998	1101	820	698	348	102	9	5146
	82-83	0	0	43	313	758	978	1012	747	682	481	198	18	5230
	83-84	0	0	25	222	682								929
LEAD-VILLE	AVE	272	337	522	817	1173	1435	1473	1318	1320	1038	726	439	10870
	82-83		323	540	974	1260	1426	1399	1259	1301	1220	886	544	11132
	83-84	308	316	488	832	1189								3133
LIMON	AVE	8	6	144	448	834	1070	1156	960	936	570	299	100	6531
	82-83	18	5	184	539	936	1124	1077	898	935	792	464	166	7138
	83-84	7	0	109	442	874								1432
LONGMONT	AVE	0	6	162	453	843	1082	1194	938	874	546	256	78	6432
	82-83	7	0	164	517	894	1087	1001	809	836	664	406	128	6513
	83-84	1	0	91	382	849								1323
MEEKER	AVE	28	56	261	564	927	1240	1345	1086	998	651	394	164	7714
	82-83	33	7	245	657	998	1225	1157	1010	901	806	498	199	7736
	83-84	12	2	145	512	897								1568
MONTROSE	AVE	0	10	135	437	837	1159	1218	941	818	522	254	69	6400
	82-83	4	2	111	556	846	1104	1094	828	759	620	347	89	6360
	83-84	0	0	73	390	833								1296
PAGOSA SPRINGS	AVE	82	113	297	608	981	1305	1380	1123	1026	732	487	233	8367
	82-83	76	29	253	732	938	1338	1274	1013	943	819	565	286	8266
	83-84	51	10	190	566	977								1794
PUEBLO	AVE	0	0	89	346	744	998	1091	834	756	421	163	23	5465
	82-83	0	0	63	427	794	1010	974	833	740	561	258	50	5710
	83-84	0	0	52	330	689								1071
RIFLE	AVE	6	24	177	499	876	1249	1321	1002	856	555	298	82	6945
	82-83	8	3	150	596	871	1129	1082	833	738	669	394	107	6580
	83-84	3	0	86	430	835								1354
STEAMBOAT SPRINGS	AVE	113	169	390	704	1101	1476	1541	1277	1184	810	533	297	9595
	82-83	146	80	368	791	1183	1482	1446	1146	1024	939	618	333	9556
	83-84	120	61	334	663	1071								2249
STERLING	AVE	0	6	157	462	876	1163	1274	966	896	528	235	51	6614
	82-83	3	3	154	518	933	1098	1046	762	827	674	363	111	6492
	83-84	1	0	98	392	801								1292
TELLURIDE	AVE	163	223	396	676	1026	1293	1339	1151	1141	849	589	318	9164
	82-83	139	140	364	746	1022	1265	1195	1042	1036	956	620	355	8880
	83-84	108	130	288	597	1012								2135
TRINIDAD	AVE	0	0	86	359	738	973	1051	846	781	468	207	35	5544
	82-83	0	0	66	367	705	949	956	779	730	619	318	66	5555
	83-84	0	0	55	291									346
WALDEN	AVE	198	285	501	822	1170	1457	1535	1313	1277	915	642	351	10466
	82-83	201	141	469	878	1242	1441	1396	1173	1122	1052	761	391	10267
	83-84	156	114	387	759	1120								2536
WALSEN-BURG	AVE	0	8	102	370	720	924	989	820	781	501	240	49	5504
	82-83	0	1	95	400	714	927	880	719	763	627	314	92	5532
	83-84	0	0	87	310	683								1080

COLORADO CLIMATE -- DECEMBER 1983

Colorado Climate Center
Department of Atmospheric Science
Fort Collins, Colorado 80523

December was one of those months we'll be telling our grandchildren about. Mountain snows fell daily piling up to incredible early season depths. Meanwhile, the Eastern Plains survived one of the coldest Decembers ever recorded.

Significant Highlights -- December

Date	Event
1-3	Cold period east of the mountains, but mild west. Subzero temperatures along the Platte Valley on the 1st. Storm system passed south of Colorado bringing snow to most of the mountains, rain and even a few thundershowers to the western valleys, and a few inches of snow to the San Luis Valley and southeastern Colorado.
4-6	Another storm system from the Pacific crossed Colorado bringing snow to most of the mountains. Heavy precipitation on the 4th in parts of the San Juans. Wolf Creek Pass received 1.87" of water-equivalent precipitation in 24 hours. Only a few snowshowers east of the mountains but temperatures remained colder than average.
7-12	Mild period statewide. A few 60°F temperatures occurred in southeastern Colorado. Pueblo's 66° reading on the 8th was the warmest in the state. No precipitation east of the mountains with several episodes of moderate westerly downslope winds. Daily snowfall continued in the higher elevation areas of the Northern and Central Mountains.
13-16	Large frigid high pressure area over western Canada began gradually moving southward bringing colder temperatures to eastern Colorado. Moist northwesterly flow continued to bring light snow to the mountains and western Valleys. An inch or two of snow fell along the eastern foothills from Boulder southward to New Mexico on the 15th.
17-29	Record cold east. Record snow west. Onslaught of brutally cold weather east of the mountains. Simultaneously one of the snowiest periods on record for the western half of the state. Eight consecutive days, 18-25th, with nighttime temperatures below zero in northeastern Colorado including a

five day period from the 20th to the 25th when many stations stayed below zero continuously day and night. The high at Limon on the 21st was a meager -9°F. Many record low temperatures were broken including -21° at Denver and -23° at Akron on the 21st. Several inches of dry snow accompanied the cold. A brief respite on the 26th brought sunshine and temperatures near the freezing point on the plains with some temperatures near 50° near the foothills. Snow returned to eastern Colorado on the 27th followed by much colder temperature. Anywhere from 1 to 12" of new snow fell on the 27th and 28th east of the Continental Divide including the San Luis Valley. Monte Vista and Center both received at least 0.60" of water-equivalent precipitation. As the skies cleared, more record low temperatures were noted including -20° at Pueblo and Longmont and -25° at Rocky Ford on the morning of the 29th. That same morning temperatures in some mountain locations dropped below -30°. Readings of -37° were noted at Maybell, Kremmling, and near Granby. Taylor Park Reservoir's -39° reading was the coldest in the state.

For the most part, western Colorado missed the extreme cold. Instead, they received unprecedented December snowfall. Normally dry locations such as Eagle were not spared. They received 2 feet of snow from the 19th to the 28th including 13 inches on the 23rd-24th. Grand Junction received 17" during the same period helping to make this their snowiest December in over 90 years of record. In the mountains, snowfall was amazing. Snow fell each day from the 17th to the 28th in many mountain locations. Totals for the 12-day period included 33" at Aspen, 38" at Hayden, 41" at Dillon, 43" at Glenwood Springs, 49" at Steamboat Springs, 56" at Climax, 62" at Winter Park, 70" at Berthoud Pass and 80" at Wolf Creek Pass. The heaviest snows fell on Christmas Eve when many mountain locations picked up more than a foot of new snow. Needless to say, Coloradoans enjoyed a white Christmas. By the end of the month, snowdepths in western Colorado ranged from 1 to 2 feet in the lower valleys to 5 to 8 feet in the high country, and it won't be melting soon.

30-31 A change was in the wind as December came to an end. A warm, dry weather pattern was setting up west of Colorado, but one more shot of snow delivered a few more inches of snow to the mountains on the 30-31st. Fort Collins even experienced a spring-like rainshower on the 31st.

Precipitation Summary

Precipitation totals and percents of average for December are shown in Figures 1 and 2. December totals east of the mountains were fairly close to average ranging from about 50% of average in the northeast to

more than 200% of average near Pueblo and along the New Mexico border. As is usual for eastern Colorado during midwinter, most areas received less than 0.75" of moisture.

Conditions were much different in the western half of the state. Totals were typically 3.00 to 6.00" of water-equivalent precipitation near the mountains with Berthoud Pass setting a new record with 8.45" (123" snow). Hayden's 5.11" (74.5" snow) was also a new record. For areas such as Grand Junction, Steamboat Springs, Glenwood Springs, and Gunnison, this was the wettest December since the memorable month of December 1951. Portions of extreme southwestern Colorado were only about 50% wetter than usual. Otherwise, the majority of western Colorado received from 2 to 4 times the normal December precipitation. Kremmling's 3.38" total was 433% of average.

Water-Year Precipitation to Date

Precipitation totals are much above average over most of the state. Since October 1, portions of northwestern Colorado have received 2 1/2 times their normal precipitation. Berthoud Pass has already received 18" of water. The only drier than average areas are found in southeastern Colorado in the Arkansas Valley. Cheyenne Wells, for example, has received only 0.64" of precipitation in the past 3 months, less than half of average.

The heavy precipitation has already prompted concern over the possibility of spring and summer flooding. While there is good cause for careful monitoring, it is much too early to be alarmed.

Temperature Summary

Figure 4 shows the tremendous temperature differences caused by the mountain barrier. While the Eastern Plains were as much as 15 degrees colder than average (the coldest December on record for several Eastern Plains stations), portions of western Colorado were actually a little warmer than usual. Gunnison and Grand Junction, for example, were each more than 2 degrees warmer than average. Some very interesting comparisons can be made. For December, Sterling (elev. 3940 feet) and Climax (elev. 11,350 feet) had nearly the same monthly mean temperature

(12.0°F). Greeley and Gunnison were identical (16.1°F). And finally, Sterling and Fort Morgan were both colder than Alamosa. That doesn't happen very often.

Heating Degree Days

Heating degree day information for several Colorado cities is listed in Table 1. Totals ranged from 1061 in Delta to 1637 in Sterling. The cold temperatures east of the mountains produced degree day totals from 35 to 50% greater than average and last year. As a result, energy consumption for heating purposes was very high. Many home owners will be seeing the highest energy bills of their lives. In the rest of the state, degree day totals were typical for this time of year and were similar to last year.

Figure 1. December 1983 precipitation amounts (inches).

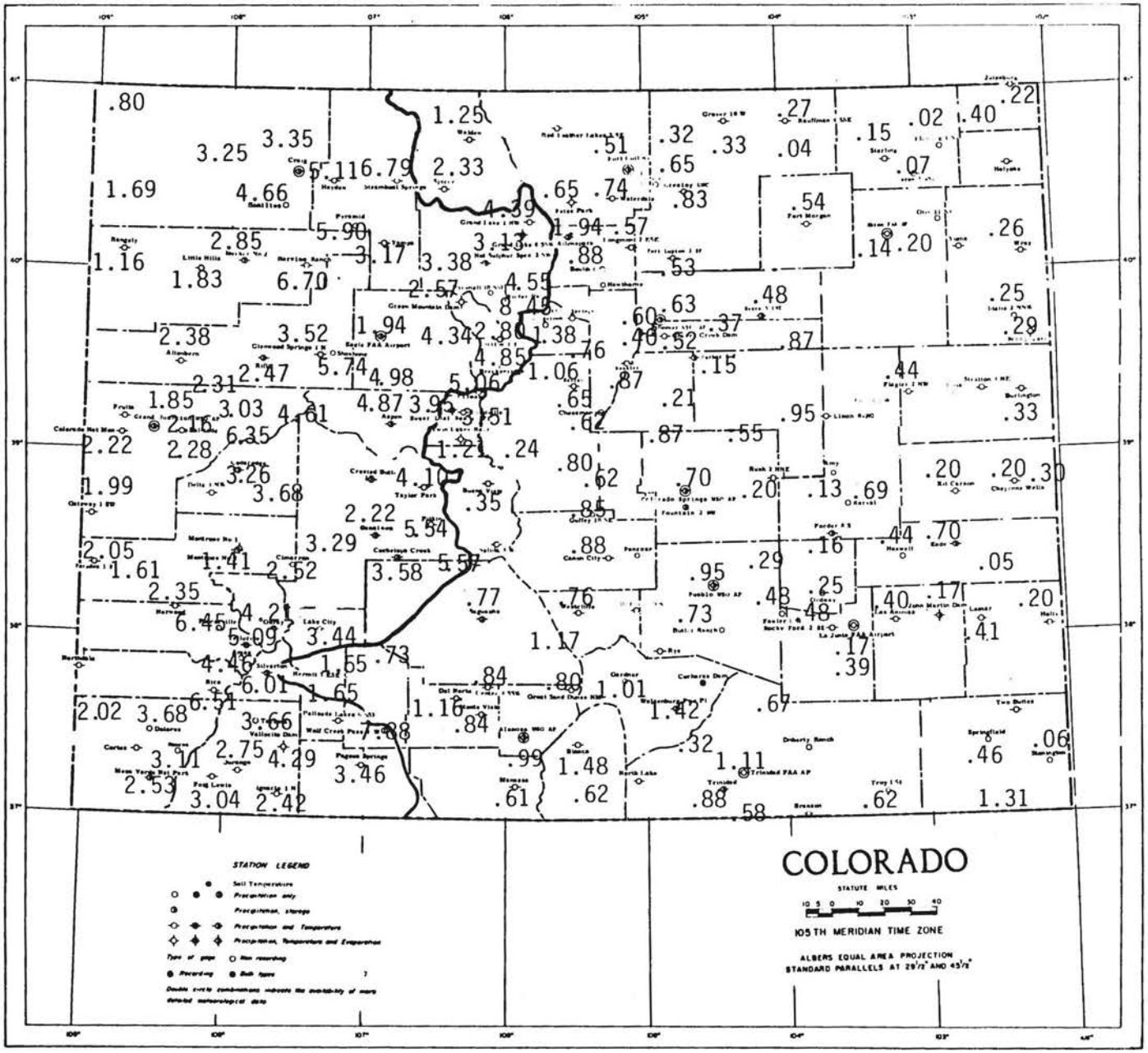


Figure 2. Precipitation for December 1983 as a percent of the 1961-1980 average.

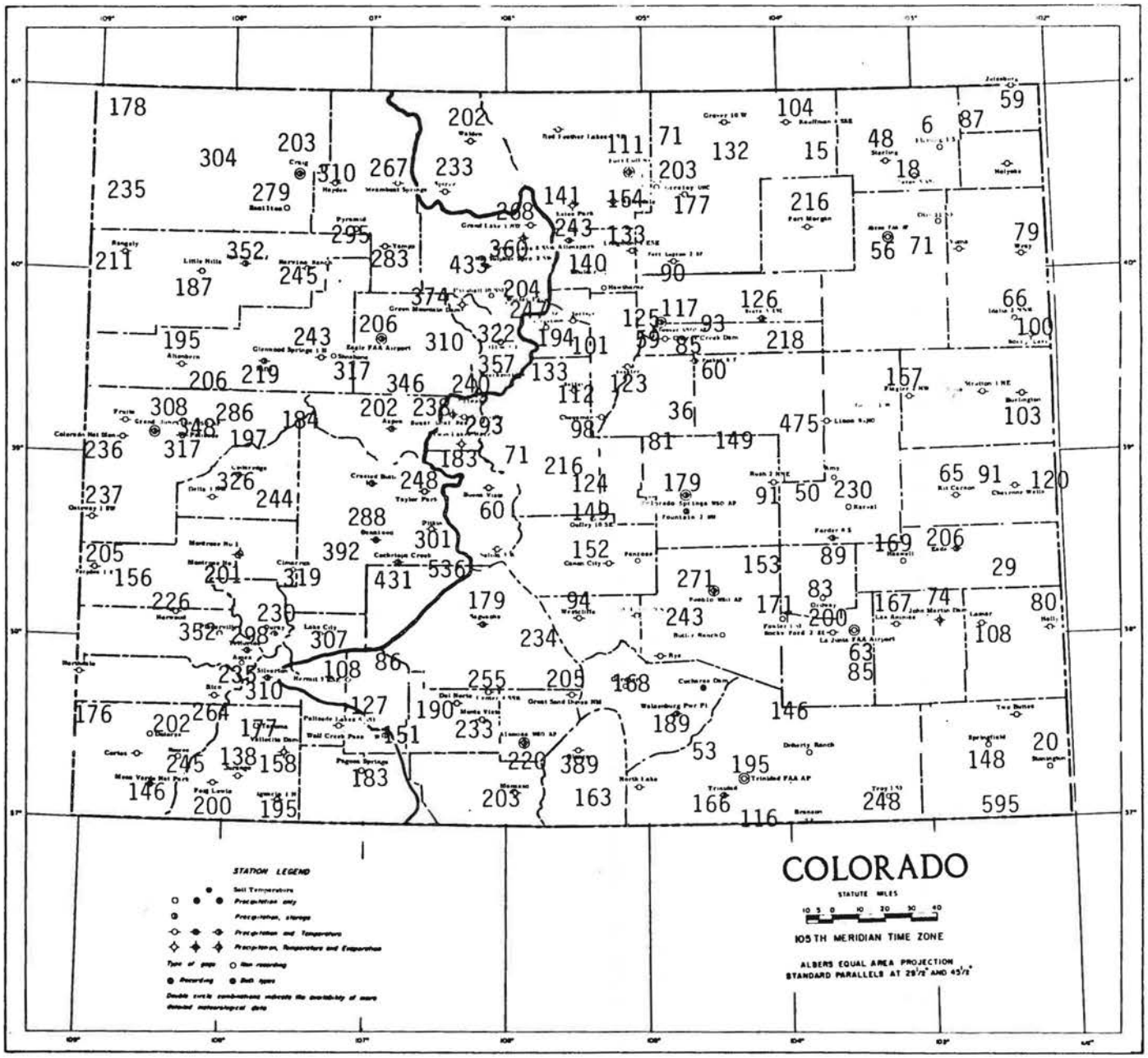
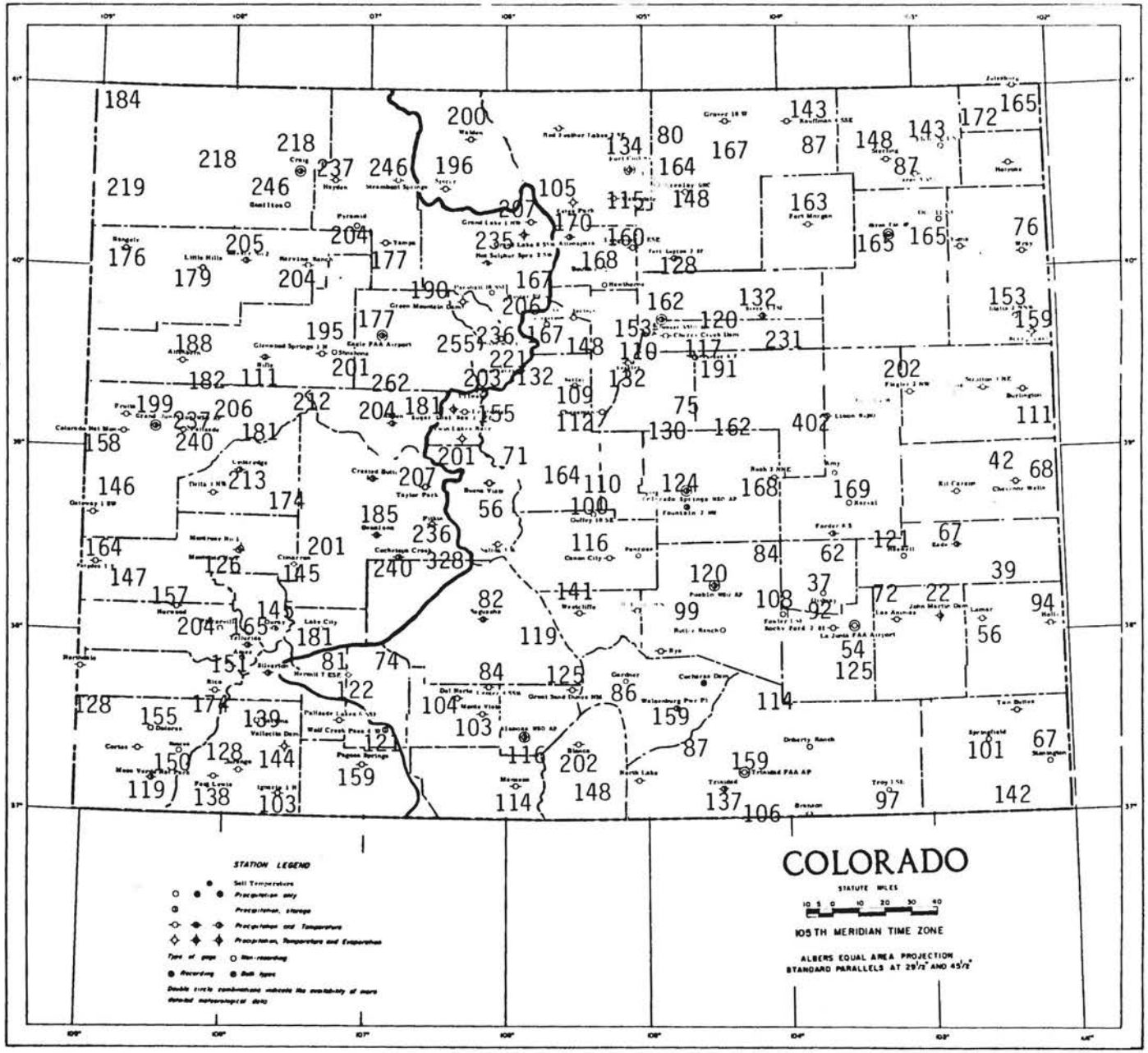


Figure 3. Precipitation for October through December 1983 as a percent of the 1961-1980 average.



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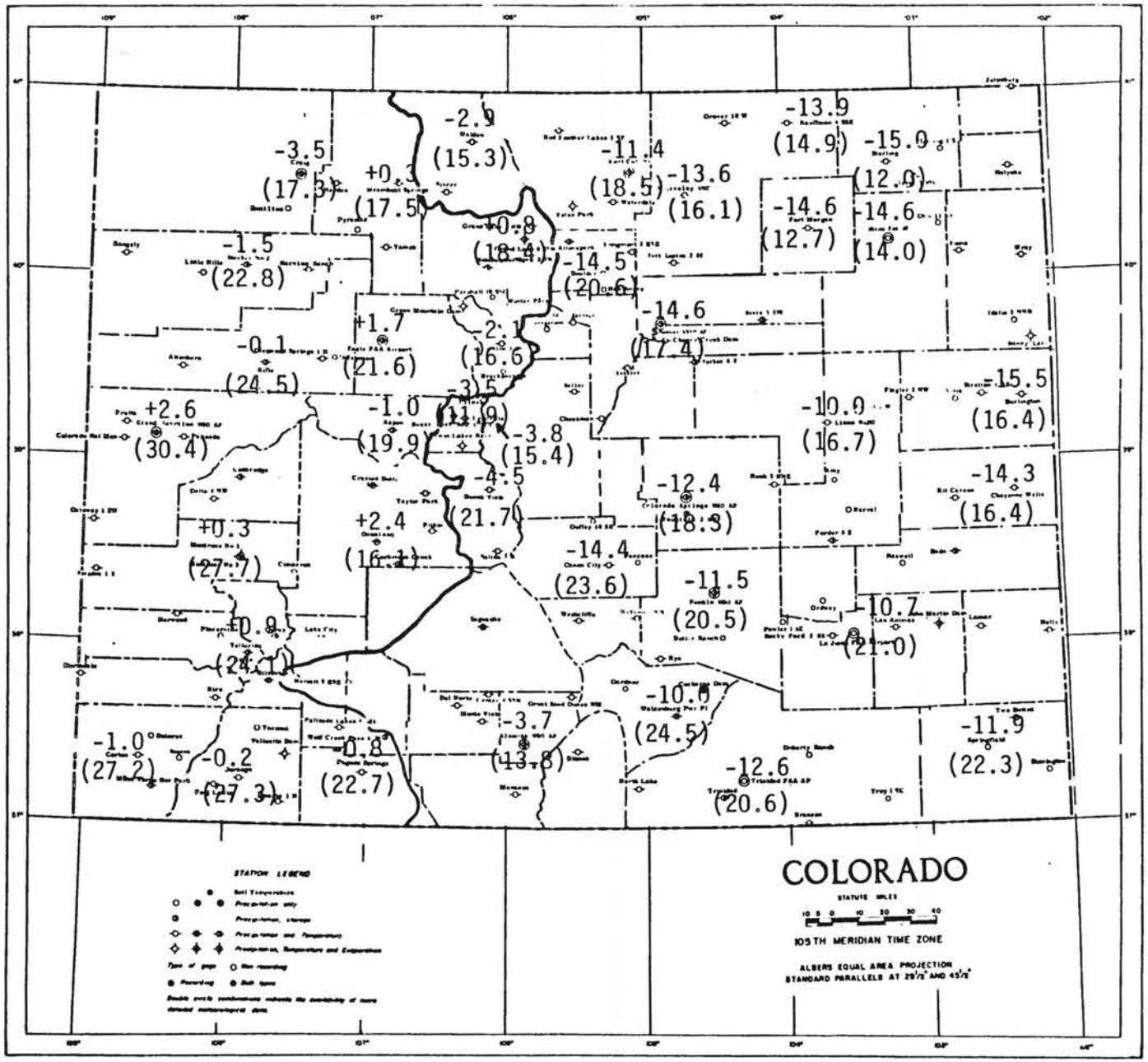

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	82-83	4	0	154	442	769	913	963	819	811	639	380	120	6014
	83-84	4	0	84	350	753	1367							2558
BUENA VISTA	AVE	47	116	285	577	936	1184	1218	1025	983	720	459	184	7734
	82-83	47	70	284	745	798	1160	1105	995	990	897	547	266	7904
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BURLING-TON	AVE	6	5	108	364	762	1017	1110	871	803	459	200	38	5743
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CANON CITY	AVE	0	9	81	301	639	831	911	734	707	411	179	33	4836
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DELTA	AVE	0	0	94	394	813	1135	1197	890	753	429	167	31	5903
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	83-84	0	0	60	340	727	1061							2188
DENVER	AVE	0	0	135	414	789	1004	1101	879	837	528	253	74	6014
	82-83	3	0	151	487	875	1050	1017	789	885	712	419	129	6517
	83-84	3	0	87	372	833	1466							2761
DILLON	AVE	273	332	513	806	1167	1435	1516	1305	1296	972	704	435	10754
	82-83	318	253	511	959	1235	1450	1418	1265	1227	1158	842	496	11132
	83-84	263	224	438	789	1135	1492							4341
DURANGO	AVE	9	34	193	493	837	1153	1218	958	862	600	366	125	6848
	82-83	24	6	175	614	874	1197	1130	909	850	735	405	147	7066
	83-84	3	0	124	464	899	1161							2651
EAGLE	AVE	33	80	288	626	1026	1407	1448	1148	1014	705	431	171	8377
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EVER-GREEN	AVE	59	113	327	621	916	1135	1199	1011	1009	730	489	218	7827
	82-83	110	41	339	733	1032	1184	940	979	1056	961	694	324	8393
	83-84	72	15	228	605	971	1449							3340
FORT COLLINS	AVE	5	11	171	468	846	1073	1181	930	877	558	281	82	6483
	82-83	4	0	178	509	925	1082	968	787	830	715	389	127	6514
	83-84	2	0	115	415	843	1432							2807
FORT MORGAN	AVE	0	6	140	438	867	1156	1283	969	874	516	224	47	6520
	82-83	3	3	123	492	895	1086	1050	804	798	663	346	108	6371
	83-84	0	0	77	368	782	1614							2841
GRAND JUNCTION	AVE	0	0	65	325	762	1138	1225	882	716	403	148	19	5683
	82-83	2	0	61	397	704	993	946	668	586	482	239	22	5090
	83-84	0	0	27	208	678	1066							1979

HEATING DEGREE DATA

STATION		JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	ANN
GRAND LAKE	AVE	214	264	468	775	1128	1473	1593	1369	1318	951	654	384	10591
	82-83	254	180	452	878	1236	1505	1489	1280	1219	1157	803	443	10896
	83-84	233	156	400	703	1052	1436							3980
GREELEY	AVE	0	0	149	450	861	1128	1240	946	856	522	238	52	6442
	82-83	5	0	154	478	888	1075	988	770	806	688	379	113	6344
	83-84	3	0	72	375	843	1507							2800
GUNNISON	AVE	111	188	393	719	1119	1590	1714	1422	1231	816	543	276	10122
	82-83	132	89	374	778	1146	1394	1379	1118	990	925	612	318	9255
	83-84	75	60	299	641	1128	1486							3689
LAS ANIMAS	AVE	0	0	45	296	729	998	1101	820	698	348	102	9	5146
	82-83	0	0	43	313	758	978	1012	747	682	481	198	18	5230
	83-84	0	0	25	222	682	1357							2286
LEAD-VILLE	AVE	272	337	522	817	1173	1435	1473	1318	1320	1038	726	439	10870
	82-83		323	540	974	1260	1426	1399	1259	1301	1220	886	544	11132
	83-84	308	316	488	832	1189	1529							4662
LIMON	AVE	8	6	144	448	834	1070	1156	960	936	570	299	100	6531
	82-83	18	5	184	539	936	1124	1077	898	935	792	464	166	7138
	83-84	7	0	109	442	874	1491							2923
LONGMONT	AVE	0	6	162	453	843	1082	1194	938	874	546	256	78	6432
	82-83	7	0	164	517	894	1087	1001	809	836	664	406	128	6513
	83-84	1	0	91	382	849	1500							2823
MEEKER	AVE	28	56	261	564	927	1240	1345	1086	998	651	394	164	7714
	82-83	33	7	245	657	998	1225	1157	1010	901	806	498	199	7736
	83-84	12	2	145	512	897	1298							2866
MONTROSE	AVE	0	10	135	437	837	1159	1218	941	818	522	254	69	6400
	82-83	4	2	111	556	846	1104	1094	828	759	620	347	89	6360
	83-84	0	0	73	390	833	1147							2443
PAGOSA SPRINGS	AVE	82	113	297	608	981	1305	1380	1123	1026	732	487	233	8367
	82-83	76	29	253	732	938	1338	1274	1013	943	819	565	286	8266
	83-84	51	10	190	566	977	1306							3100
PUEBLO	AVE	0	0	89	346	744	998	1091	834	756	421	163	23	5465
	82-83	0	0	63	427	794	1010	974	833	740	561	258	50	5710
	83-84	0	0	52	330	689	1375							2446
RIFLE	AVE	6	24	177	499	876	1249	1321	1002	856	555	298	82	6945
	82-83	8	3	150	596	871	1129	1082	833	738	669	394	107	6580
	83-84	3	0	86	430	835	1249							2603
STEAMBOAT SPRINGS	AVE	113	169	390	704	1101	1476	1541	1277	1184	810	533	297	9595
	82-83	146	80	368	791	1183	1482	1446	1146	1024	939	618	333	9556
	83-84	120	61	334	663	1071	1463							3712
STERLING	AVE	0	6	157	462	876	1163	1274	966	896	528	235	51	6614
	82-83	3	3	154	518	933	1098	1046	762	827	674	363	111	6492
	83-84	1	0	98	392	801	1637							2929
TELLURIDE	AVE	163	223	396	676	1026	1293	1339	1151	1141	849	589	318	9164
	82-83	139	140	364	746	1022	1265	1195	1042	1036	956	620	355	8880
	83-84	108	130	288	597	1012	1261							3396
TRINIDAD	AVE	0	0	86	359	738	973	1051	846	781	468	207	35	5544
	82-83	0	0	66	367	705	949	956	779	730	619	318	66	5555
	83-84	0	0	55	291	698	1368							1714
WALDEN	AVE	198	285	501	822	1170	1457	1535	1313	1277	915	642	351	10466
	82-83	201	141	469	878	1242	1441	1396	1173	1122	1052	761	391	10267
	83-84	156	114	387	759	1120	1534							4070
WALSEN-BURG	AVE	0	8	102	370	720	924	989	820	781	501	240	49	5504
	82-83	0	1	95	400	714	927	880	719	763	627	314	92	5532
	83-84	0	0	87	310	683	1248							2328

COLORADO CLIMATE -- JANUARY 1984

Colorado Climate Center
Department of Atmospheric Science
Fort Collins, Colorado 80523

A weather pattern shift occurred at the beginning of January helping to produce dry weather across Colorado for most of the month. With the help of predominantly clear skies, very cold air remained trapped in some of the snowcovered western valleys throughout the month. One siege of winter weather brought snow and extreme cold to the entire state in mid January.

Significant Highlights--January

Date	Event
1	The last in a long series of Nov.-Dec. storms moved eastward. A little lingering mountain snow with a few early morning rain and snow showers on the Eastern Plains.
2-10	Sunny skies with moderating temperatures mountains and east as a large high pressure ridge remained fixed over the western U.S. Daytime temperatures in the 50's as far west as Estes Park and Nederland. Downslope winds accentuated the warming on the 5th producing the warmest temperatures since November for much of the Front Range area. Boulder soared to 71°F on the 5th, the warmest reading in the state. Lakewood and Walsenburg reached 63°, while Fort Morgan and Sterling in the Platte River Valley could only muster 45° and 42° readings, respectively. Increasing clouds and a bit colder by the 9th and 10th as a large cold air mass swept into the Central U.S. A few Eastern Plains snow flurries. Meanwhile, Western Slope cities remained cold throughout the period as the deep snowcover reflected the sun's rays back to space allowing cold stable air to become trapped in the valley bottoms. Subzero nighttime temperatures were common from Craig southward to the San Luis Valley.
11-12	Active storm system raced across the western U.S. bringing locally heavy mountain snows. Most areas received less than 5" of new snow, but Wolf Creek Pass picked up 22" (2.00" water equivalent) in just 24 hours.
13-14	Strong surge of Arctic air moved into eastern Colorado setting up easterly "upslope" flow. Powdery snow fell over all of eastern Colorado from the foothills to Kansas. Snowfall amounts were generally 2-6 inches. However, the

Loveland-Fort Collins area was surprised by 10-14" of new snow in just a few hours. Precipitation also fell over most mountain areas as an upper level storm system passed over. Precipitation was generally light to moderate except in isolated areas with good southwest exposures. Cedaredge, for example, received a combination of rain and wet snow totalling 1.36" water equivalent. Pagosa Springs measured 14" of new snow (1.24" water equivalent). Again, Wolf Creek Pass "took the cake" with 33" of new snow (2.46" water) on the 13-14th, while Berthoud Pass only got 2".

15 Bright, sunny cold day. A few mountain snow showers. Temperatures plunged below zero over the fresh Front Range snowcover. The Waterdale station west of Loveland dipped to -14°F.

16-17 New Arctic air mass pushed southward into the northeast half of Colorado during the day. Snowfall on the Eastern Plains, along with strong easterly winds, produced blizzard conditions. Temperatures during the day on the 17th fell below zero producing dangerous wind chills for livestock and humans. As much as 8" of new dry snow fell on the Plains while little or no new snow fell in the mountains and western valleys.

18-20 Skies cleared and temperatures plummetted. The morning of the 18th was one of the coldest in history across the Eastern Plains and the coldest morning statewide since Jan. 12, 1963. New records for the day were set at several cities including Denver (-19°F), Greeley (-25°), and Fort Collins (-28°). Figure 5 shows statewide minimum temperatures on the 18th. At a few stations this was the coldest morning in the history of the station. Examples included -27° at John Martin Dam and -30° at Bonny Reservoir. Maybell hit -51° only to be surpassed the following morning by Taylor Park Reservoir's -53° reading for the coldest temperature in the state for January. Alamosa shivered with -40°, also on the 19th. Temperatures continued well below zero statewide on the 20th before finally beginning a gradual warm up.

21-28 Dry with a moderation of temperatures over most of Colorado. A series of upper level disturbances produced periods of cloudiness and some mountain snows. Berthoud Pass received 20" of new snow during the week. Temperatures climbed into the 20's and 30's in the mountains, and 40's and even some 50's at lower elevations by the end of the week.

29-31 Windy on the 29th as a low pressure area passed northeast of Colorado. Otherwise dry and relatively mild except for the frigid interior valleys where cold air was still trapped. On the 30th the high temperature at Buena Vista was 49° while just across the mountains to the west Gunnison struggled to make it up to 5°.

Precipitation Summary

Precipitation totals and percents of average for January are shown in Figures 1 and 2. Compared to last month, totals were paltry. Many areas of western Colorado received less than half of the January average. Lake City's monthly total of .16" was just 19% of average, while Pitkin reported no precipitation at all. Only 8 reporting stations received more than one inch of water equivalent precipitation. Wolf Creek Pass and Cedaredge were the only stations in the western half of the state receiving above average precipitation.

Precipitation totals east of the Continental Divide were essentially normal. Although most totals were less than 0.50", this was not unusual since January is often the driest month of the year east of the mountains. Totals ranged from .06" (15% of average) at Trinidad airport and .08" (17% of average) at Lakewood to a high of 1.20" (343% of average) near Idalia. The only area of Colorado with significantly above average precipitation in January was the east central plains north of the Arkansas River. Karval's .94" total was 362% of average.

Water-Year Precipitation to Date

Despite a dry January in the mountains, precipitation since October 1 is still well above average (Figure 3). A few stations in northwestern Colorado continue to show nearly double their average. East of the Divide conditions are very nearly average over the San Luis Valley and most of the Arkansas Valley. Above average winter moisture is still noted from the Front Range eastward to Nebraska.

Temperature Summary

The "cold air trapping" phenomenon produced an interesting temperature pattern over the state (Figure 4). While January temperatures were generally one to three degrees Fahrenheit colder than average statewide, open snowcovered valleys were much colder. Alamosa, for example, ended up with a monthly mean temperature of just 1.5°F, 13.3 degrees below average and nearly 3 degrees colder than the previous all time coldest month. The Taylor Park weather station also shattered all their previous monthly temperature records. Their monthly mean temperature was -5.8°F, 7.5 degrees colder than the previous record.

Their mean monthly minimum temperature was -29.1°, 19 degrees colder than average. Gunnison, Eagle, Meeker, Rangely, and Craig showed similar, although not quite as extreme, conditions. The same pattern was also noted east of the mountains. For example, Greeley and Fort Morgan in the bottom of the valley of the South Platte, were both several degrees colder than surrounding stations.

Heating Degree Days

Table 1 shows comparative heating degree day information for a number of Colorado cities. Totals were above average over almost all of the state and were generally 5 to 17% greater than normal. Gunnison totalled a whopping 2112 heating degree days in just one month, 23% more than average. Compared to January 1983, this month was very high. Totals were mostly 15 to 50% higher than last year across the entire state indicating, with all other conditions equal, that heating bills this year should be significantly higher.

NOTE: Heating degree days are approximately proportional to the amount of energy required to heat a building to a given set temperature. The degree days presented here are calculated by subtracting the mean daily temperature (the average of the daily high and low) from the base temperature, 65°F. This degree difference is summed for each day of the month to get the totals which are given here. For days when the mean temperature exceeds 65°F, the heating degree day total is zero and cooling degree days are accumulated.

Figure 1. January 1984 precipitation amounts (inches).

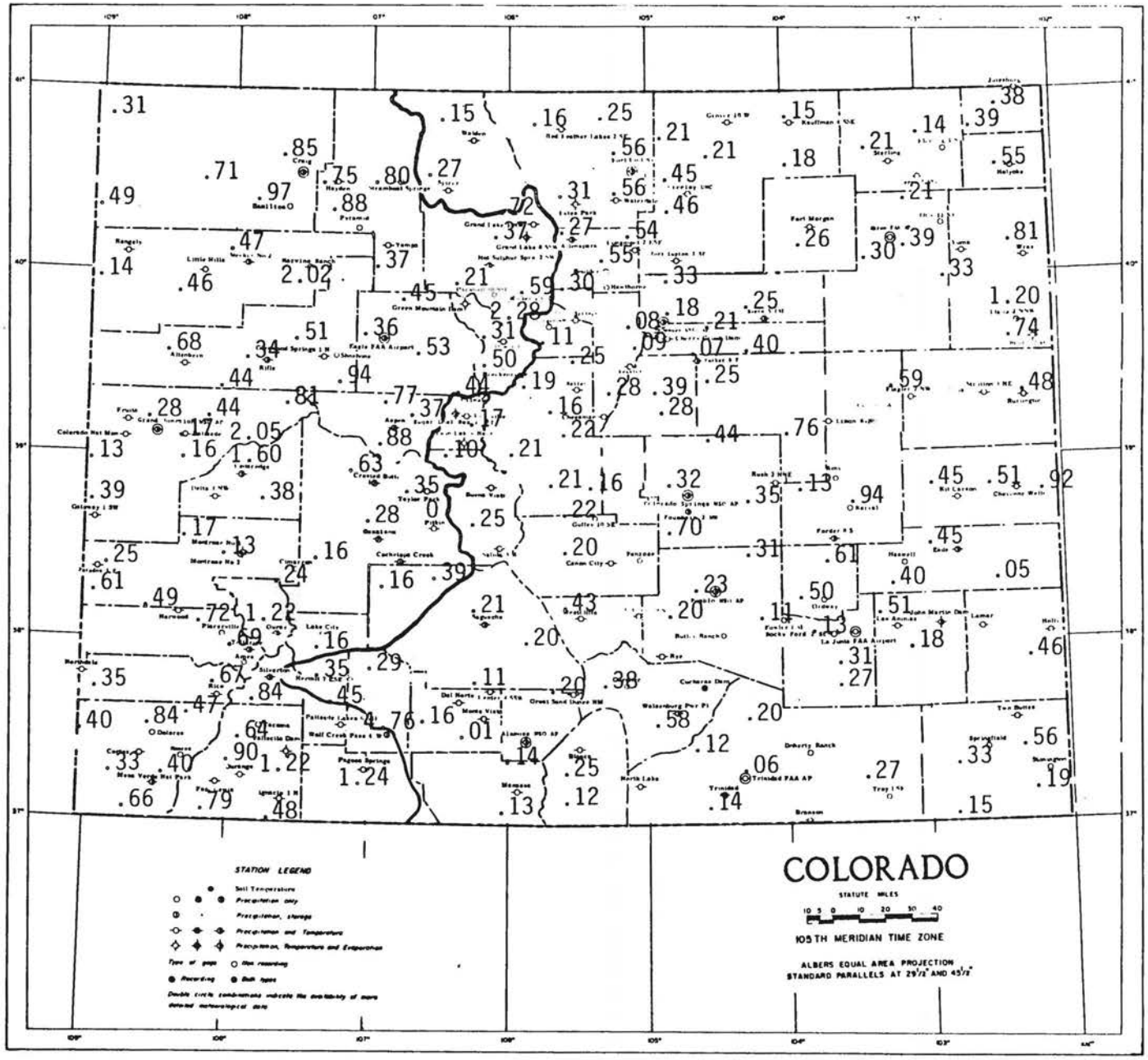

Figure 2. Precipitation for January 1984 as a percent of the 1961-1980 average.

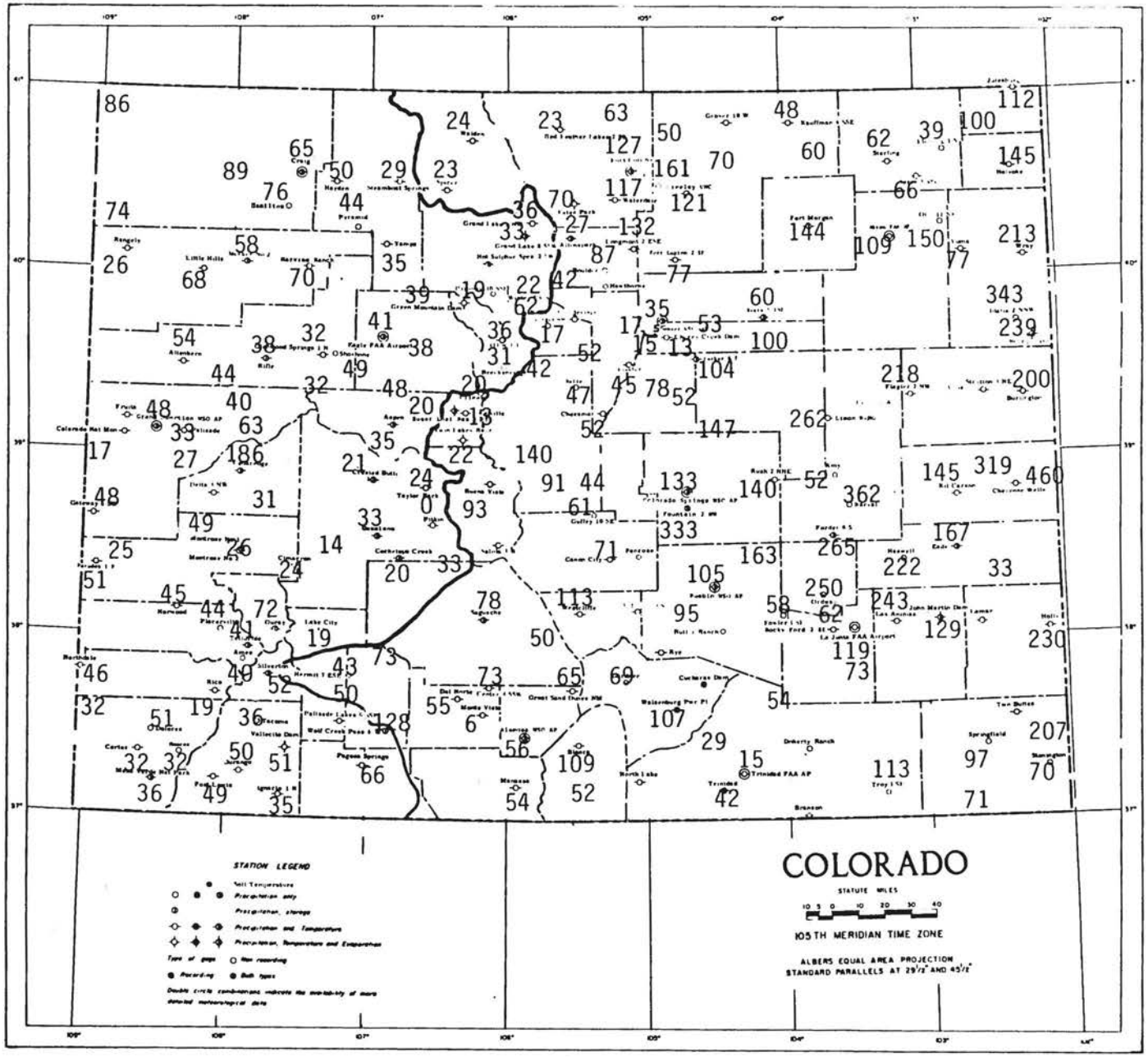

Figure 3. Precipitation for October 1983 through January 1984 as a percent of the 1961-1980 average.

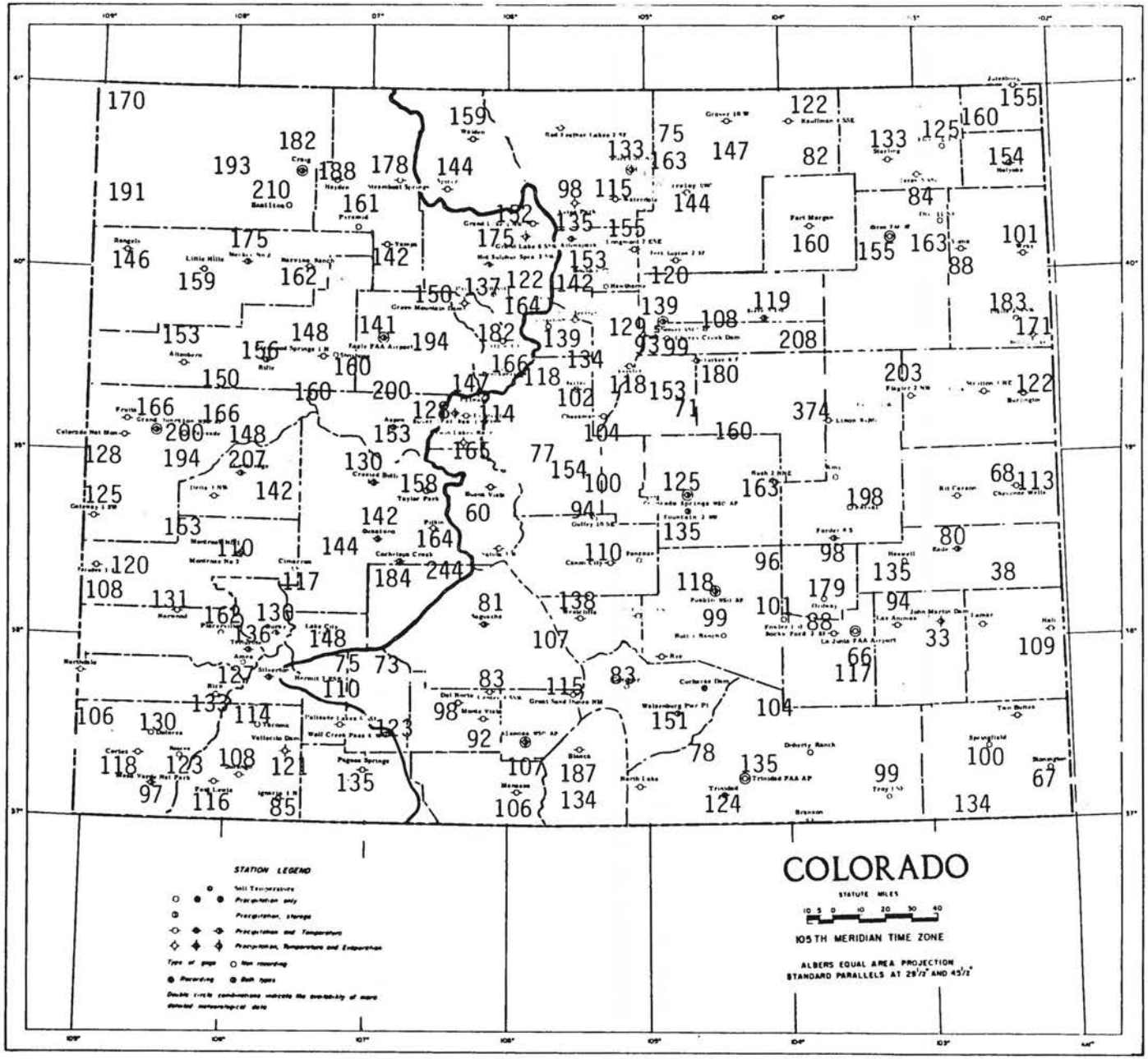

Figure 4. Temperatures for January 1984 in degrees Fahrenheit (in parentheses) and departures from the 1961-1980 average.

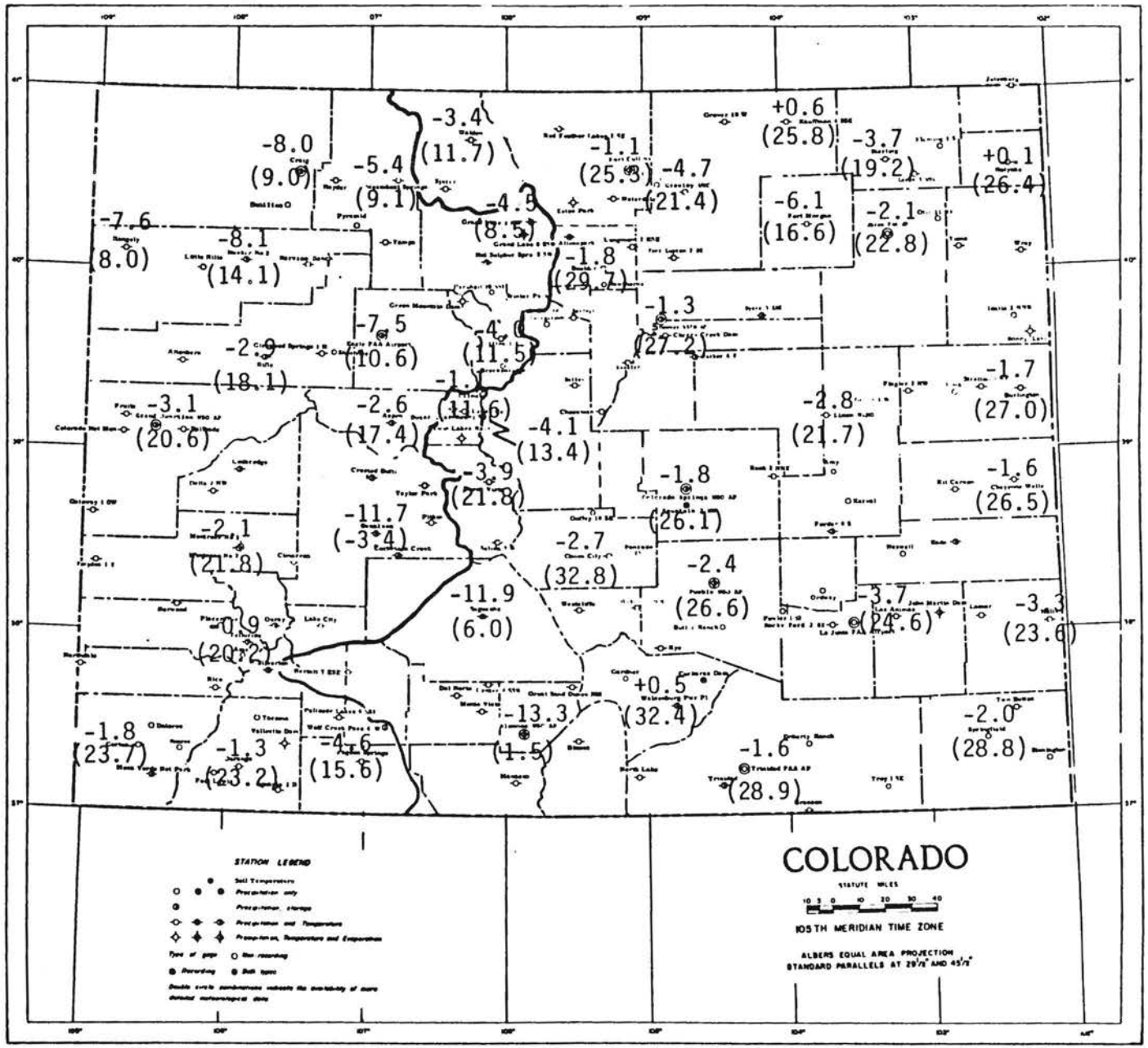

Table 1. Colorado Heating Degree Day Data through January 1984.

HEATING DEGREE DATA

STATION		JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	ANN
ALAMOSA	AVE	40	100	303	657	1074	1457	1519	1182	1035	732	453	165	8717
	82-83	59	47	274	714	1016	1361	1380	1080	945	856	556	249	8537
	83-84	28	35	213	674	1112	1581	1982						5625
ASPEN	AVE	95	150	348	651	1029	1339	1376	1162	1116	798	524	262	8850
	82-83	148	119	362	808	1105	1326	1301	1095	1066	959	691	350	9330
	83-84	97	86	269	622	1021	1392	1470						4957
BOULDER	AVE	0	6	130	357	714	908	1004	804	775	483	220	59	5460
	82-83	4	0	154	442	769	913	963	819	811	639	380	120	6014
	83-84	4	0	84	350	753	1367	1087						3645
BUENA VISTA	AVE	47	116	285	577	936	1184	1218	1025	983	720	459	184	7734
	82-83	47	70	284	745	798	1160	1105	995	990	897	547	266	7904
	83-84	45	49	234	595	970	1333	1331						4557
BURLING-TON	AVE	6	5	108	364	762	1017	1110	871	803	459	200	38	5743
	82-83	0	5	99	405	818	999	1006	784	832	637	339	81	6005
	83-84	0	0	87	359	758	1500	1172						3876
CANON CITY	AVE	0	9	81	301	639	831	911	734	707	411	179	33	4836
	82-83	3	6	109	391	745	890	829	711	726	579	302	85	5376
	83-84	0	0	71	314	649	1278	993						3305
COLORADO SPRINGS	AVE	8	25	162	440	819	1042	1122	910	880	564	296	78	6346
	82-83	8	11	198	532	880	1084	1001	851	904	742	444	159	6814
	83-84	2	0	101	417	811	1438	1197						3966
CORTEZ	AVE	0	11	115	434	813	1132	1181	921	828	555	292	68	6350
	82-83	17	5	132	606	856	1148	1168	939	878	723	438	131	7041
	83-84	5	0	98	438	854	1154	1271						3820
CRAIG	AVE	32	58	275	608	996	1342	1479	1193	1094	687	419	193	8376
	82-83	37	5	271	752	1116	1361	1305	1130	989	847	561	228	8602
	83-84	41	3	212	579	1005	1471	1730						5041
DELTA	AVE	0	0	94	394	813	1135	1197	890	753	429	167	31	5903
	82-83	2	4	81	496	777	1043	1040	753	686	513	272	66	5733
	83-84	0	0	60	340	727	1061	1366						3554
DENVER	AVE	0	0	135	414	789	1004	1101	879	837	528	253	74	6014
	82-83	3	0	151	487	875	1050	1017	789	885	712	419	129	6517
	83-84	3	0	87	372	833	1466	1162						3923
DILLON	AVE	273	332	513	806	1167	1435	1516	1305	1296	972	704	435	10754
	82-83	318	253	511	959	1235	1450	1418	1265	1227	1158	842	496	11132
	83-84	263	224	438	789	1135	1492	1653						5994
DURANGO	AVE	9	34	193	493	837	1153	1218	958	862	600	366	125	6848
	82-83	24	6	175	614	874	1197	1130	909	850	735	405	147	7066
	83-84	3	0	124	464	899	1161	1289						3940
EAGLE	AVE	33	80	288	626	1026	1407	1448	1148	1014	705	431	171	8377
	82-83	54	21	257	720	1059	1350	1273	974	880	846	529	219	8182
	83-84	30	3	203	579	962	1337	1681						4795
EVER-GREEN	AVE	59	113	327	621	916	1135	1199	1011	1009	730	489	218	7827
	82-83	110	41	339	733	1032	1184	940	979	1056	961	694	324	8393
	83-84	72	15	228	605	971	1239							3130
FORT COLLINS	AVE	5	11	171	468	846	1073	1181	930	877	558	281	82	6483
	82-83	4	0	178	509	925	1082	968	787	830	715	389	127	6514
	83-84	2	0	115	415	843	1432	1225						4032
FORT MORGAN	AVE	0	6	140	438	867	1156	1283	969	874	516	224	47	6520
	82-83	3	3	123	492	895	1086	1050	804	798	663	346	108	6371
	83-84	0	0	77	368	782	1614	1493						4334
GRAND JUNCTION	AVE	0	0	65	325	762	1138	1225	882	716	403	148	19	5683
	82-83	2	0	61	397	704	983	946	668	586	482	239	22	5090
	83-84	0	0	27	208	678	1066	1366						3345

HEATING DEGREE DATA

STATION		JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	ANN
GRAND LAKE	AVE	214	264	468	775	1128	1473	1593	1369	1318	951	654	384	10591
	82-83	254	180	452	878	1236	1505	1489	1280	1219	1157	803	443	10896
	83-84	233	156	400	703	1052	1436	1743						5723
GREELEY	AVE	0	0	149	450	861	1128	1240	946	856	522	238	52	6442
	82-83	5	0	154	478	888	1075	988	770	806	688	379	113	6344
	83-84	3	0	72	375	843	1507	1344						4144
GUNNISON	AVE	111	188	393	719	1119	1590	1714	1422	1231	816	543	276	10122
	82-83	132	89	374	778	1146	1394	1379	1118	990	925	612	318	9255
	83-84	75	60	299	641	1128	1486	2112						5801
LAS ANIMAS	AVE	0	0	45	296	729	998	1101	820	698	348	102	9	5146
	82-83	0	0	43	313	758	978	1012	747	682	481	198	18	5230
	83-84	0	0	25	222	682	1357	1246						3532
LEAD-VILLE	AVE	272	337	522	817	1173	1435	1473	1318	1320	1038	726	439	10870
	82-83		323	540	974	1260	1426	1399	1259	1301	1220	886	544	11132
	83-84	308	316	488	832	1189	1529	1594						6256
LIMON	AVE	8	6	144	448	834	1070	1156	960	936	570	299	100	6531
	82-83	18	5	184	539	936	1124	1077	898	935	792	464	166	7138
	83-84	7	0	109	442	874	1491	1334						4257
LONGMONT	AVE	0	6	162	453	843	1082	1194	938	874	546	256	78	6432
	82-83	7	0	164	517	894	1087	1001	809	836	664	406	128	6513
	83-84	1	0	91	382	849	1500	1357						4180
MEEKER	AVE	28	56	261	564	927	1240	1345	1086	998	651	394	164	7714
	82-83	33	7	245	657	998	1225	1157	1010	901	806	498	199	7736
	83-84	12	2	145	512	897	1298	1571						4437
MONTROSE	AVE	0	10	135	437	837	1159	1218	941	818	522	254	69	6400
	82-83	4	2	111	556	846	1104	1094	828	759	620	347	89	6360
	83-84	0	0	73	390	833	1147	1332						3775
PAGOSA SPRINGS	AVE	82	113	297	608	981	1305	1380	1123	1026	732	487	233	8367
	82-83	76	29	253	732	938	1338	1274	1013	943	819	565	286	8266
	83-84	51	10	190	566	977	1306	1524						4624
PUEBLO	AVE	0	0	89	346	744	998	1091	834	756	421	163	23	5465
	82-83	0	0	63	427	794	1010	974	833	740	561	258	50	5710
	83-84	0	0	52	330	689	1375	1183						3629
RIFLE	AVE	6	24	177	499	876	1249	1321	1002	856	555	298	82	6945
	82-83	8	3	150	596	871	1129	1082	833	738	669	394	107	6580
	83-84	3	0	86	430	835	1249	1445						4048
STEAMBOAT SPRINGS	AVE	113	169	390	704	1101	1476	1541	1277	1184	810	533	297	9595
	82-83	146	80	368	791	1183	1482	1446	1146	1024	939	618	333	9556
	83-84	120	61	334	663	1071	1463	1725						5437
STERLING	AVE	0	6	157	462	876	1163	1274	966	896	528	235	51	6614
	82-83	3	3	154	518	933	1098	1046	762	827	674	363	111	6492
	83-84	1	0	98	392	801	1637	1412						4341
TELLURIDE	AVE	163	223	396	676	1026	1293	1339	1151	1141	849	589	318	9164
	82-83	139	140	364	746	1022	1265	1195	1042	1036	956	620	355	8880
	83-84	108	130	288	597	1012	1261	1383						4779
TRINIDAD	AVE	0	0	86	359	738	973	1051	846	781	468	207	35	5544
	82-83	0	0	66	367	705	949	956	779	730	619	318	66	5555
	83-84	0	0	55	291	698	1368	1111						3523
WALDEN	AVE	198	285	501	822	1170	1457	1535	1313	1277	915	642	351	10466
	82-83	201	141	469	878	1242	1441	1396	1173	1122	1052	761	391	10267
	83-84	156	114	387	759	1120	1534	1643						5713
WALSEN-BURG	AVE	0	8	102	370	720	924	989	820	781	501	240	49	5504
	82-83	0	1	95	400	714	927	880	719	763	627	314	92	5532
	83-84	0	0	87	310	683	1248	1001						3329

COLORADO CLIMATE -- FEBRUARY 1984

Colorado Climate Center
Department of Atmospheric Science
Fort Collins, Colorado 80523

Below average precipitation was noted over the western half of Colorado for the second month in a row. Again, unusually cold air settled into the snowcovered mountain valleys. It was a fairly average month east of the mountains with the exception of a series of wind-driven snowstorms in mid February.

Significant Highlights -- February

Date	Event
1-6	Dominant high pressure ridge over the western U.S. produced mild and mostly clear weather over Colorado. Front Range cities enjoyed their warmest day of the month on the 1st: Denver 64°F, Boulder 66°, Pueblo 71°. But cold air remained entrenched in the western valleys. Gunnison was an extreme case. Their warmest temperature for the period was only 17° on the 4th and their thermometer plunged far below zero each night.
7-8	Upper air disturbance crossed Colorado bringing scattered snows to the mountains and the southeast plains. Aguilar received 6" of new snow from the storm while Ouray and Berthoud Pass each totalled 4". Springfield picked up 3".
9-11	Clear on the 9th. Increasing cloudiness and warmer on the 10th as a Pacific storm system approached. Precipitation mostly light and scattered in the mountains and western half of Colorado 10-11th. However, a substantial wind driven snowstorm developed across limited portions of the eastern and northeastern plains on the 11th. From just east of Denver northeastward to Julesburg 6" to 12" of wet snow fell. Akron airport received 1.07" of water equivalent moisture while Fort Morgan received just a trace.
12	Clearing and chilly.
13-15	Increasing clouds and warmer as another Pacific storm system entered Colorado. Several stations reported their warmest temperature for the month. Holly hit 75°F on the 14th, the warmest in the state. Locally heavy mountain snows: Ouray 10", Telluride 12", Berthoud Pass 13". Rain and snow

spilled out onto the Eastern Plains during the afternoon of the 14th accompanied by strong winds as a deep low pressure center developed over the Texas Panhandle. Precipitation was again extremely variable across eastern Colorado with the heaviest snows along the southern foothills. The Trinidad area received from 4 to 9" of new snow.

16-18 Another active storm system of Pacific origin took aim at Colorado. The mountains picked up up a few inches of new snow. Amounts were generally light although the Ouray-Ridgway area was surprised by more than 10" of new snow. The storm gathered strength as it moved onto the plains late on the 17th. Snow and strong winds closed highways for the 3rd time in a week. Almost all of the plains got some snow but the heaviest precipitation fell in a band from Trinidad northeastward to Bonny Reservoir where 6-12" of snow fell. Bonny Reservoir measured 1.37" of water equivalent moisture from the storm.

19-22 Sunny, dry and cold period. Many mountain locations had their coldest temperatures of the month on the 19th and 20th. Walden dipped to -21°F on the 20th, but Taylor Park was the state's icebox with a -44° reading that morning. The mountains remained chilly but the Eastern Plains warmed into the 50's and 60's by the 21-22nd.

23-24 Upper air disturbance triggered a few high mountain snow showers. Colder east, continued cold west.

25-27 A vigorous storm system brought bad weather to much of Colorado for the 3rd consecutive weekend. The storm was concentrated along the Front Range and eastern foothills where it wreaked havoc on Saturday evening ski traffic returning to Denver. Nederland and Evergreen each received about a foot of snow while Westcliffe totalled 17" of snow in less than 24 hours. Denver-Boulder-Fort Collins snowfall ranged from 4-6". Eastern Colorado was spared the brunt of this storm, but it later redeveloped into a huge Midwest blizzard.

28-29 Sunny skies but cold temperatures followed the storm. Much of eastern Colorado had their coldest temperatures for the month on the 28th. Walsenburg for example dropped to +2°F.

Precipitation Summary

Precipitation totals and percents of average for February are shown in Figures 1 and 2. Despite the barrage of mid-month storms, the western half of Colorado ended up drier than average. Only about one-third the average monthly precipitation fell in extreme southwestern

Colorado and along the Colorado River. Parachute received only .07", 8% of average. An interesting anomaly was the Ouray area where nearly double the average precipitation fell. Ouray's 3.13" total was the greatest in the state.

Conditions east of the Continental Divide were incredibly variable. Little or no precipitation fell during February in the Arkansas Valley from Fowler to Buena Vista. North Park, northern Weld, Larimer, and Logan counties, and the northwestern half of the San Luis Valley were all drier than average. Meanwhile, most of the foothills from Trinidad to Boulder were wetter than usual, and the Eastern Plains probably thought it was March instead of "normally dry" February. On the average, plains stations received about four times more precipitation than usual. At least a dozen plains stations received more than an inch of precipitation. For February that is very unusual.

Water-Year Precipitation to Date

Precipitation since October 1 continues near or above average over most of Colorado (Figure 3). Two months of dry weather in the mountains have helped reduce the concern about the flood threat from excessive snowpack, but many changes can still occur during the spring months. Overall, water supplies are in good shape for this time of year.

Temperature Summary

The "cold air trapping" phenomenon occurred again over western Colorado (Figure 4). While high elevation, non-valley stations were near average in February, valley bottom stations were extremely cold. Alamosa, for example, was 11.6 degrees colder than average -- close to a record. Rangely, in the lower White River valley, was almost as cold. Gunnison's monthly mean temperature was only 4.3 degrees, 30 degrees colder than Denver. East of the mountains temperatures were quite close to average with few daily extremes.

Heating Degree Days

Table 1 shows comparative heating degree day information for a number of Colorado cities. Totals were near average over eastern

Colorado and ranged from above to much above average over the western part of the state as a direct result of below average temperatures in February. Differences were even more dramatic when compared to February 1983. This month's totals were generally 7% to 57% more than last year. This simply means that heating bills this month should be greater statewide than last year with dramatic differences in places like Alamosa and Gunnison.

A Special Notice to Weather Enthusiasts

A new organization has recently been formed which is geared for amateur weather observers and general weather lovers. It is called the Association of American Weather Observers. Its basic objectives are: "1) To enhance the education of all weather enthusiasts, 2) To promote communication among all weather enthusiasts, and 3) To provide a spirit of cooperation among all weather enthusiasts." Annual membership dues are $15 which include 10 issues of the organization's publication, The American Weather Observer. Information on membership can be obtained by writing:

Association of American Weather Observers
P. O. Box 455
Belvidere, Illinois 61008

The first publication came out in January and looked very interesting. It looks like this organization could become a fun, active, down to earth group of avid weather lovers. If interest is high, local chapters may form here in Colorado.

Figure 1. February 1984 precipitation amounts (inches).

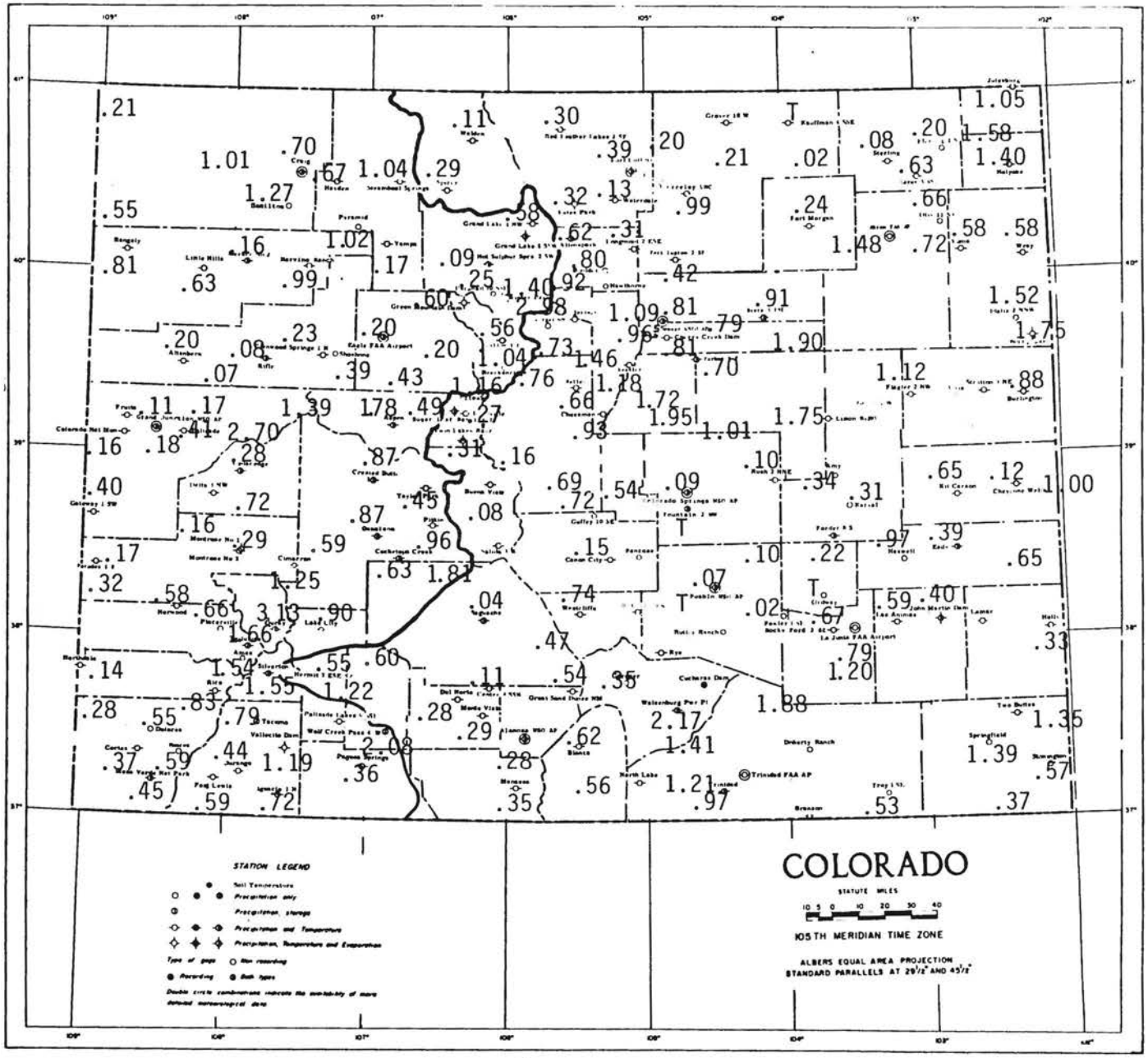

Figure 2. Precipitation for February 1984 as a percent of the 1961-1980 average.

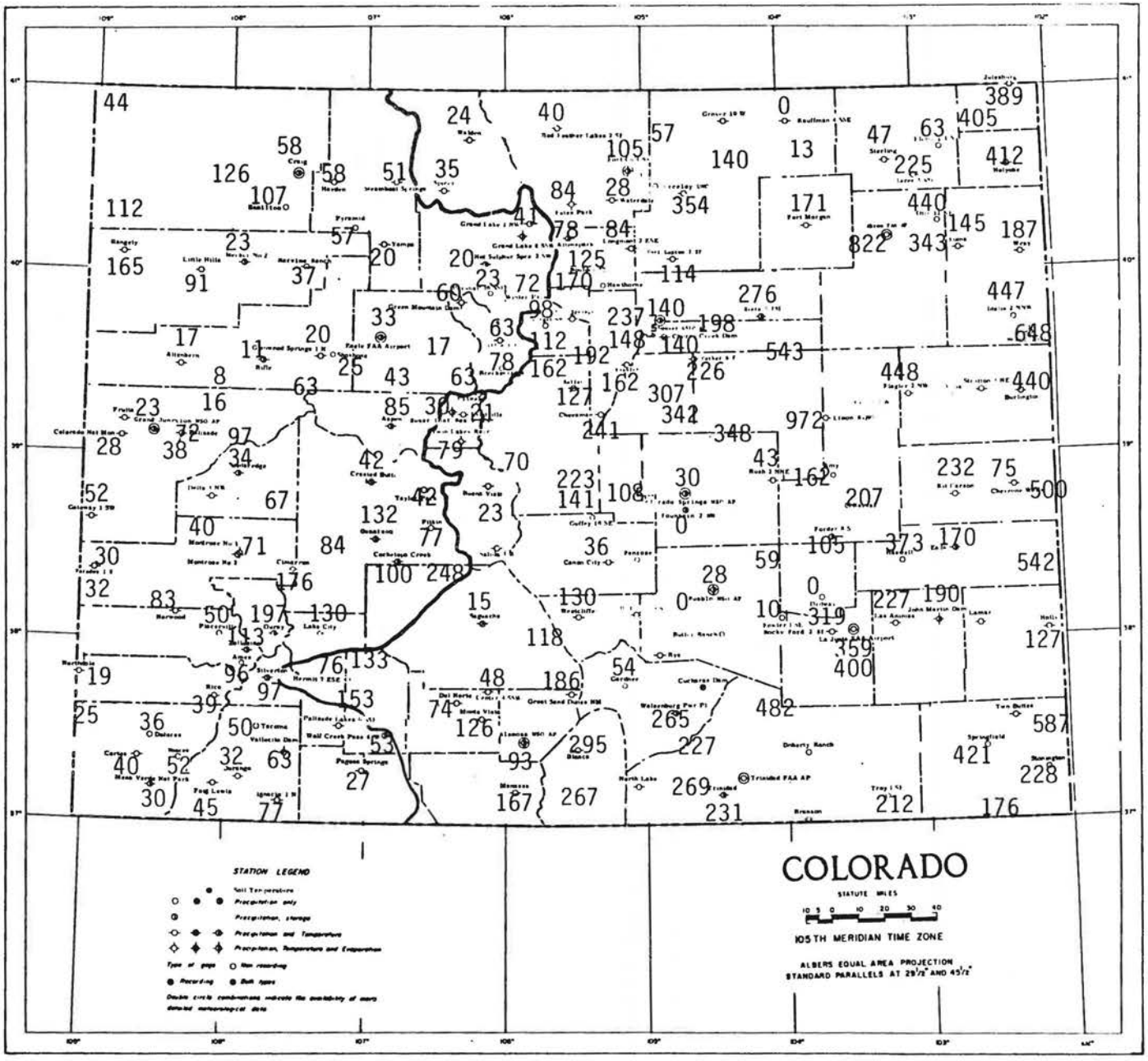

Figure 3. Precipitation for October 1983 through February 1984 as a percent of the 1961-1980 average.

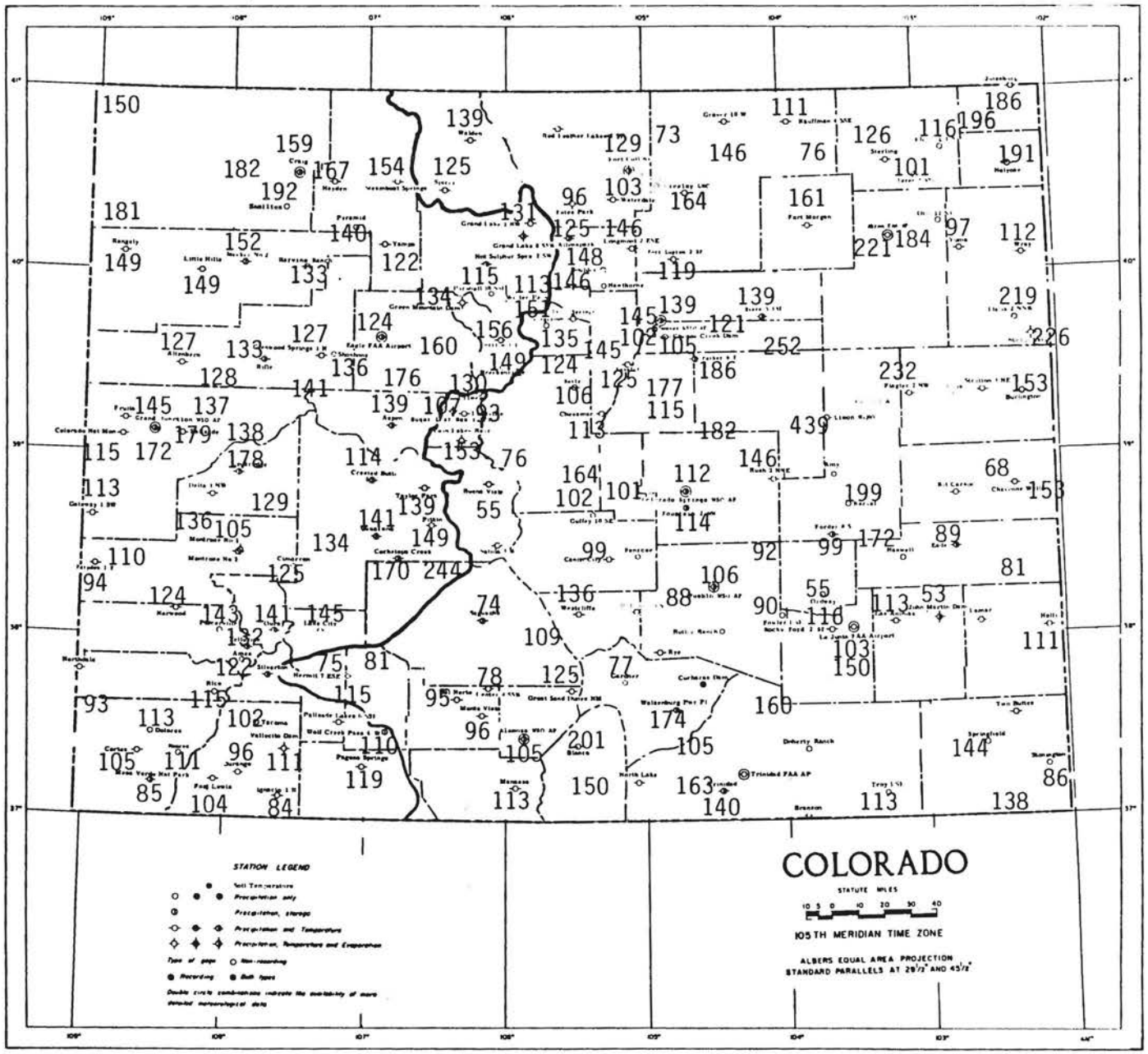

Figure 4. Temperatures for February 1984 in degrees Fahrenheit (in parentheses) and departures from the 1961-1980 average.

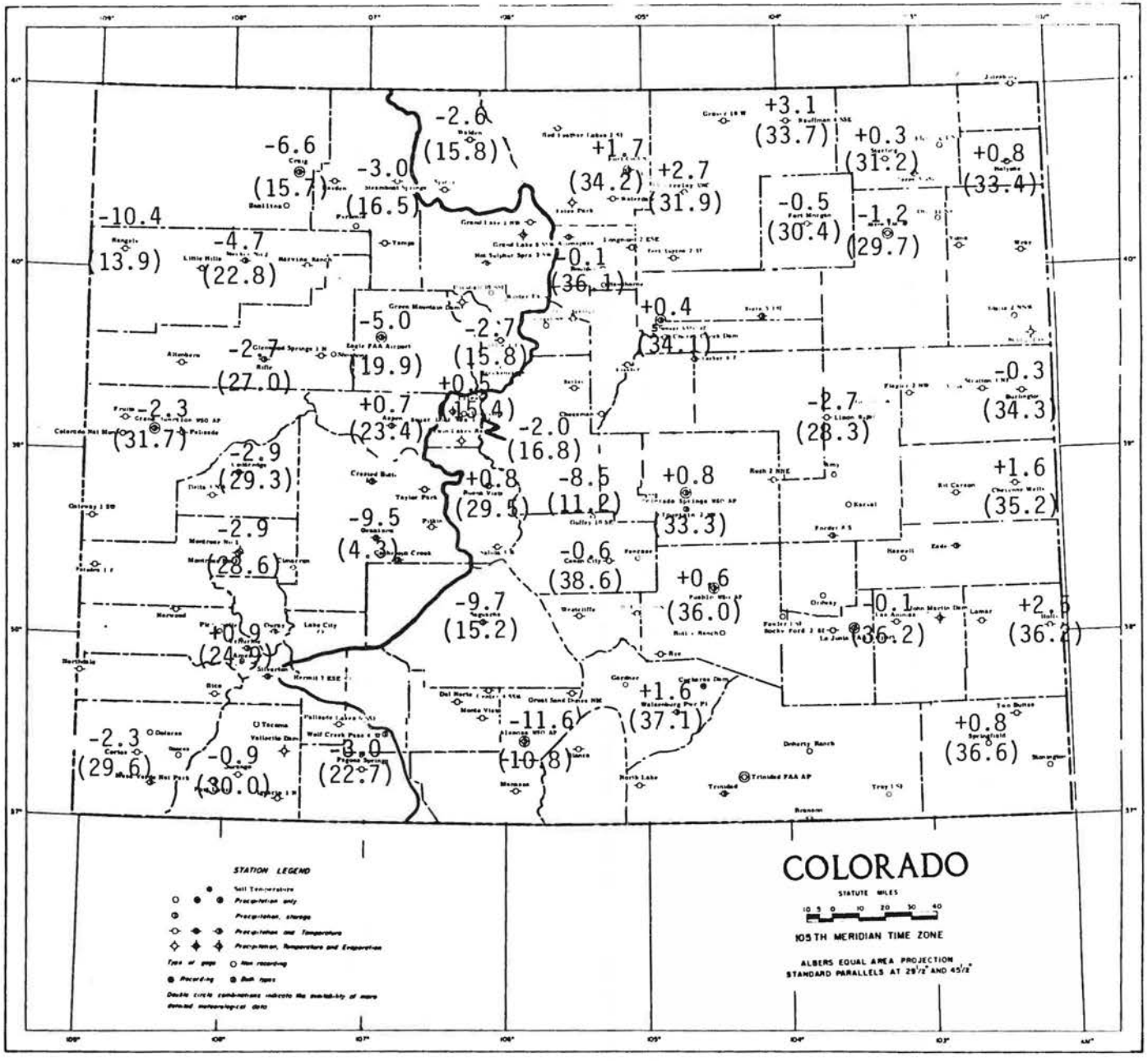

Table 1. Colorado Heating Degree Day Data through February 1984.

HEATING DEGREE DATA

STATION		JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	ANN
ALAMOSA	AVE	40	100	303	657	1074	1457	1519	1182	1035	732	453	165	8717
	82-83	59	47	274	714	1016	1361	1380	1080	945	856	556	249	8537
	83-84	28	35	213	674	1112	1581	1982	1566					7191
ASPEN	AVE	95	150	348	651	1029	1339	1376	1162	1116	798	524	262	8850
	82-83	148	119	362	808	1105	1326	1301	1095	1066	959	691	350	9330
	83-84	97	86	269	622	1021	1392	1470	1200					6157
BOULDER	AVE	0	6	130	357	714	908	1004	804	775	483	220	59	5460
	82-83	4	0	154	442	769	913	963	819	811	639	380	120	6014
	83-84	4	0	84	350	753	1367	1087	830					4475
BUENA VISTA	AVE	47	116	285	577	936	1184	1218	1025	983	720	459	184	7734
	82-83	47	70	284	745	798	1160	1105	995	990	897	547	266	7904
	83-84	45	49	234	595	970	1333	1331	1020					5577
BURLING-TON	AVE	6	5	108	364	762	1017	1110	871	803	459	200	38	5743
	82-83	0	5	99	405	818	999	1006	784	832	637	339	81	6005
	83-84	0	0	87	359	758	1500	1172	884					4760
CANON CITY	AVE	0	9	81	301	639	831	911	734	707	411	179	33	4836
	82-83	3	6	109	391	745	890	829	711	726	579	302	85	5376
	83-84	0	0	71	314	649	1278	993	760					4005
COLORADO SPRINGS	AVE	8	25	162	440	819	1042	1122	910	880	564	296	78	6346
	82-83	8	11	198	532	880	1084	1001	851	904	742	444	159	6814
	83-84	2	0	101	417	811	1438	1197	911					4877
CORTEZ	AVE	0	11	115	434	813	1132	1181	921	828	555	292	68	6350
	82-83	17	5	132	606	856	1148	1168	939	878	723	438	131	7041
	83-84	5	0	98	438	854	1154	1271	1018					4838
CRAIG	AVE	32	58	275	608	996	1342	1479	1193	1094	687	419	193	8376
	82-83	37	5	271	752	1116	1361	1305	1130	989	847	561	228	8602
	83-84	41	3	212	579	1005	1471	1730	1420					6461
DELTA	AVE	0	0	94	394	813	1135	1197	890	753	429	167	31	5903
	82-83	2	4	81	496	777	1043	1040	753	686	513	272	66	5733
	83-84	0	0	60	340	727	1061	1366	1006					4560
DENVER	AVE	0	0	135	414	789	1004	1101	879	837	528	253	74	6014
	82-83	3	0	151	487	875	1050	1017	789	885	712	419	129	6517
	83-84	3	0	87	372	833	1466	1162	889					4812
DILLON	AVE	273	332	513	806	1167	1435	1516	1305	1296	972	704	435	10754
	82-83	318	253	511	959	1235	1450	1418	1265	1227	1158	842	496	11132
	83-84	263	224	438	789	1135	1492	1653	1419					7413
DURANGO	AVE	9	34	193	493	837	1153	1218	958	862	600	366	125	6848
	82-83	24	6	175	614	874	1197	1130	909	850	735	405	147	7066
	83-84	3	0	124	464	899	1161	1289	1009					4949
EAGLE	AVE	33	80	288	626	1026	1407	1448	1148	1014	705	431	171	8377
	82-83	54	21	257	720	1059	1350	1273	974	880	846	529	219	8182
	83-84	30	3	203	579	962	1337	1681	1299					6094
EVER-GREEN	AVE	59	113	327	621	916	1135	1199	1011	1009	730	489	218	7827
	82-83	110	41	339	733	1032	1184	940	979	1056	961	694	324	8393
	83-84	72	15	228	605	971	1449	1239	1040					5619
FORT COLLINS	AVE	5	11	171	468	846	1073	1181	930	877	558	281	82	6483
	82-83	4	0	178	509	925	1082	968	787	830	715	389	127	6514
	83-84	2	0	115	415	843	1432	1225	887					4919
FORT MORGAN	AVE	0	6	140	438	867	1156	1283	969	874	516	224	47	6520
	82-83	3	3	123	492	895	1086	1050	804	798	663	346	108	6371
	83-84	0	0	77	368	782	1614	1493	998					5332
GRAND JUNCTION	AVE	0	0	65	325	762	1138	1225	882	716	403	148	19	5683
	82-83	2	0	61	397	704	983	946	668	586	482	239	22	5090
	83-84	0	0	27	208	678	1066	1366	958					4303

HEATING DEGREE DATA

STATION		JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	ANN
GRAND LAKE	AVE	214	264	468	775	1128	1473	1593	1369	1318	951	654	384	10591
	82-83	254	180	452	878	1236	1505	1489	1280	1219	1157	803	443	10896
	83-84	233	156	400	703	1052	1436	1743						5723
GREELEY	AVE	0	0	149	450	861	1128	1240	946	856	522	238	52	6442
	82-83	5	0	154	478	888	1075	988	770	806	688	379	113	6344
	83-84	3	0	72	375	843	1507	1344	955					5099
GUNNISON	AVE	111	188	393	719	1119	1590	1714	1422	1231	816	543	276	10122
	82-83	132	89	374	778	1146	1394	1379	1118	990	925	612	318	9255
	83-84	75	60	299	641	1128	1486	2112	1752					7553
LAS ANIMAS	AVE	0	0	45	296	729	998	1101	820	698	348	102	9	5146
	82-83	0	0	43	313	758	978	1012	747	682	481	198	18	5230
	83-84	0	0	25	222	682	1357	1246	826					4358
LEAD-VILLE	AVE	272	337	522	817	1173	1435	1473	1318	1320	1038	726	439	10870
	82-83		323	540	974	1260	1426	1399	1259	1301	1220	886	544	11132
	83-84	308	316	488	832	1189	1529	1594	1389					7645
LIMON	AVE	8	6	144	448	834	1070	1156	960	936	570	299	100	6531
	82-83	18	5	184	539	936	1124	1077	898	935	792	464	166	7138
	83-84	7	0	109	442	874	1491	1334	1057					5314
LONGMONT	AVE	0	6	162	453	843	1082	1194	938	874	546	256	78	6432
	82-83	7	0	164	517	894	1087	1001	809	836	664	406	128	6513
	83-84	1	0	91	382	849	1500	1357	915					5095
MEEKER	AVE	28	56	261	564	927	1240	1345	1086	998	651	394	164	7714
	82-83	33	7	245	657	998	1225	1157	1010	901	806	498	199	7736
	83-84	12	2	145	512	897	1298	1571	1217					5654
MONTROSE	AVE	0	10	135	437	837	1159	1218	941	818	522	254	69	6400
	82-83	4	2	111	556	846	1104	1094	828	759	620	347	89	6360
	83-84	0	0	73	390	833	1147	1332	1049					4824
PAGOSA SPRINGS	AVE	82	113	297	608	981	1305	1380	1123	1026	732	487	233	8367
	82-83	76	29	253	732	938	1338	1274	1013	943	819	565	286	8266
	83-84	51	10	190	566	977	1306	1524	1219					5843
PUEBLO	AVE	0	0	89	346	744	998	1091	834	756	421	163	23	5465
	82-83	0	0	63	427	794	1010	974	833	740	561	258	50	5710
	83-84	0	0	52	330	689	1375	1183	834					4463
RIFLE	AVE	6	24	177	499	876	1249	1321	1002	856	555	298	82	6945
	82-83	8	3	150	596	871	1129	1082	833	738	669	394	107	6580
	83-84	3	0	86	430	835	1249	1445	1094					5142
STEAMBOAT SPRINGS	AVE	113	169	390	704	1101	1476	1541	1277	1184	810	533	297	9595
	82-83	146	80	368	791	1183	1482	1446	1146	1024	939	618	333	9556
	83-84	120	61	334	663	1071	1463	1725	1400					6837
STERLING	AVE	0	6	157	462	876	1163	1274	966	896	528	235	51	6614
	82-83	3	3	154	518	933	1098	1046	762	827	674	363	111	6492
	83-84	1	0	98	392	801	1637	1412	973					5314
TELLURIDE	AVE	163	223	396	676	1026	1293	1339	1151	1141	849	589	318	9164
	82-83	139	140	364	746	1022	1265	1195	1042	1036	956	620	355	8880
	83-84	108	130	288	597	1012	1261	1383	1154					5933
TRINIDAD	AVE	0	0	86	359	738	973	1051	846	781	468	207	35	5544
	82-83	0	0	66	367	705	949	956	779	730	619	318	66	5555
	83-84	0	0	55	291	698	1368	1111						3523
WALDEN	AVE	198	285	501	822	1170	1457	1535	1313	1277	915	642	351	10466
	82-83	201	141	469	878	1242	1441	1396	1173	1122	1052	761	391	10267
	83-84	156	114	387	759	1120	1534	1643	1417					7130
WALSEN-BURG	AVE	0	8	102	370	720	924	989	820	781	501	240	49	5504
	82-83	0	1	95	400	714	927	880	719	763	627	314	92	5532
	83-84	0	0	87	310	683	1248	1001	801					4130

COLORADO CLIMATE -- MARCH 1984

Colorado Climate Center
Department of Atmospheric Science
Fort Collins, Colorado 80523

March brought near average to considerably above average precipitation to most of Colorado. Weekends were especially prone to stormy weather. Temperatures were a little cooler than average across most of the state except where unusually cold air remained entrenched in a few of the western valleys.

Significant Highlights--March

Date	Event
1-2	Dry and quite mild.
3-5	A rapidly developing upper level disturbance entered Colorado on the 3rd bringing a period of snow to most of the mountains from the San Juans northward. Precipitation amounts were fairly light except in the Ouray-Ridgway area where nearly 10" of snow fell. Snow also spread southward along the Front Range on the 3rd and 4th dropping 2" of snow on the Denver area and up to 10" near Walsenberg and 14" at Palmer Lake. The Eastern Plains were breezy and cold but no appreciable precipitation fell. Skies cleared on the 5th and most of the western two-thirds of Colorado had their coldest morning of the month. Colorado Springs dipped to 5°F and Trinidad had a 0°, while the Granby area shivered with -25°. Taylor Park Reservoir's -42° reading was the coldest in the state for March.
6-9	Dry and chilly. Northwesterly winds aloft. A second surge of cold air dropped across the Eastern Plains on the 7th. Many locations had their coldest temperature of the month early on the 8th such as the 10° reading at Holly.
10-12	Warming temperatures statewide. A small disturbance in the middle atmosphere crossed Colorado and triggered scattered rain and snowshowers from the Utah border to the Front Range. While most precipitation was light, Uravan, Montrose, and Ouray received about 0.50" of water-equivalent.
13-16	Another round of wet weather occurred over most of western Colorado. Significant precipitation was noted in a few

areas. Meeker received 0.71" from the storm. Wolf Creek Pass totalled 0.92" (16" snow), and Redstone measured 1.69" (13" snow). Meanwhile, dry weather prevailed east of the mountains. Very warm weather occurred in eastern Colorado on the 14th accompanied by southwesterly winds. Denver reached 70° for the first time since early November. Holly hit 81°, the warmest in the state.

17-19 A very strong storm system crossed just south of Colorado producing moderate to heavy precipitation over much of the mountains and the Eastern Plains. Berthoud Pass reported 20.5" of new snow. Precipitation amounts in excess of 1.00" were common over the Eastern Plains, and several sites reported at least one foot of wet wind-driven snow. Walsenburg's 1.65" (17.5" snow) was one of the highest totals.

20-23 A brief respite on the 20-21st brought the warmest temperatures of the month to the mountains and Western Slope. Durango reached 65° and Grand Junction hit 67° on the 21st. Clouds and cooler weather then set in. Broad areas received a few inches of snow beginning late on the 21st. Snowfall totals included: Akron 6", Berthoud Pass 9", Burlington 5", Colorado Springs 7", Alamosa 5".

24-27 After a brief break, another storm promptly hit the state accompanied by cold temperatures. A moderate dose of snow fell on assorted areas: Bailey 10", Aspen 8", Westcliffe 7", Ouray 14", Aguilar 12".

28-31 Yet another storm began to spread scattered snow over most areas of the state beginning late on the 29th. Grand Junction picked up 3", Fort Collins and Nunn 7", Bonny Lake 6", bringing the month to a typical stormy end. Temperatures remained unseasonably chilly, especially east of the mountains.

Precipitation Summary

Precipitation totals and percents of average for March are shown in Figures 1 and 2. The majority of Colorado was wetter than average. The lower valleys from Aspen and Eagle west to Utah received nearly twice as much precipitation as usual, while the surrounding high terrain was near normal. Very heavy precipitation was also noted from Montrose to Ouray and across the southern half of the Gunnison basin. Montrose's 1.99" total was 375% of average. East of the Continental Divide there were also many abnormally wet and snowy locations. More than double the average precipitation fell across the southern portion of the San Luis

Valley, on the Palmer Ridge from south of Denver to Colorado Springs and across much of the southeastern and east central plains. Arapahoe, east of Cheyenne Wells, measured 3.85" of precipitation, 550% of average. Walsenburg's 4.00" total (40.5" snow) was 303% of average. The greatest monthly precipitation was 10.20" (96" snow) at the new weather station at the base of Mt. Evans west of Denver.

Portions of Colorado were spared the heavy March precipitation. Precipitation totals in extreme northwest Colorado were only about 80% of average. The entire southwest corner of the state was drier than average. Northdale received just 0.40", 53% of average. Other dry areas included the extreme upper Arkansas Valley near Leadville, the northern portion of the Gunnison Valley, a little bit of the upper Colorado basin near Granby, the northern end of the San Luis Valley and the extreme northeast corner of the state. Julesburg was the driest reporting station in Colorado with a monthly total of just 0.20", 17% of average.

Water-Year Precipitation to Date

Precipitation for the first 6 months of the 1984 water year is well above average over most of Colorado (Figure 3). The only areas indicating near to slightly below average precipitation are the southern and eastern slopes of the San Juan Mountains, the extreme southwestern corner of the state, some of the San Luis Valley, and a few isolated spots in the upper Arkansas Valley and the Eastern Plains. Since reservoir storage and snowpack are also above average for this time of year, surface water supplies for the coming summer should be plentiful.

Temperature Summary

Most of Colorado was a little cooler than average in March (Figure 4). Temperatures east of the mountains ranged from 0.5 degrees Fahrenheit above average at Fort Collins to 3.7 degrees below average at Burlington. More variation was noted in the mountains and western valleys. Abnormally cold temperatures occurred for the third consecutive month in the San Luis Valley and upper Gunnison Valley. Gunnison averaged 18.5°F for the month. 7.0 degrees below normal.

Overnight low temperatures dropped below 0° on 25 days in March at Taylor Park Reservoir -- a new record, bringing their winter total to 115 subzero days. Meanwhile, other locations such as Durango, Steamboat Springs, and Grand Junction were a bit warmer than usual.

Heating Degree Days

Table 1 shows comparative heating degree day information for a number of Colorado cities. Totals were generally near the longterm average but ranged from 12% below average at Grand Junction to 17% above average at Gunnison. Comparing to March 1983, degree day totals this year were about the same along the Front Range. However, totals on the Eastern Plains and on the Western Slope were significantly higher, indicating higher energy bills than last year. Most totals were 5 to 15% greater than last year, but Gunnison showed an incredible 45% difference.

Figure 1. March 1984 precipitation amounts (inches).

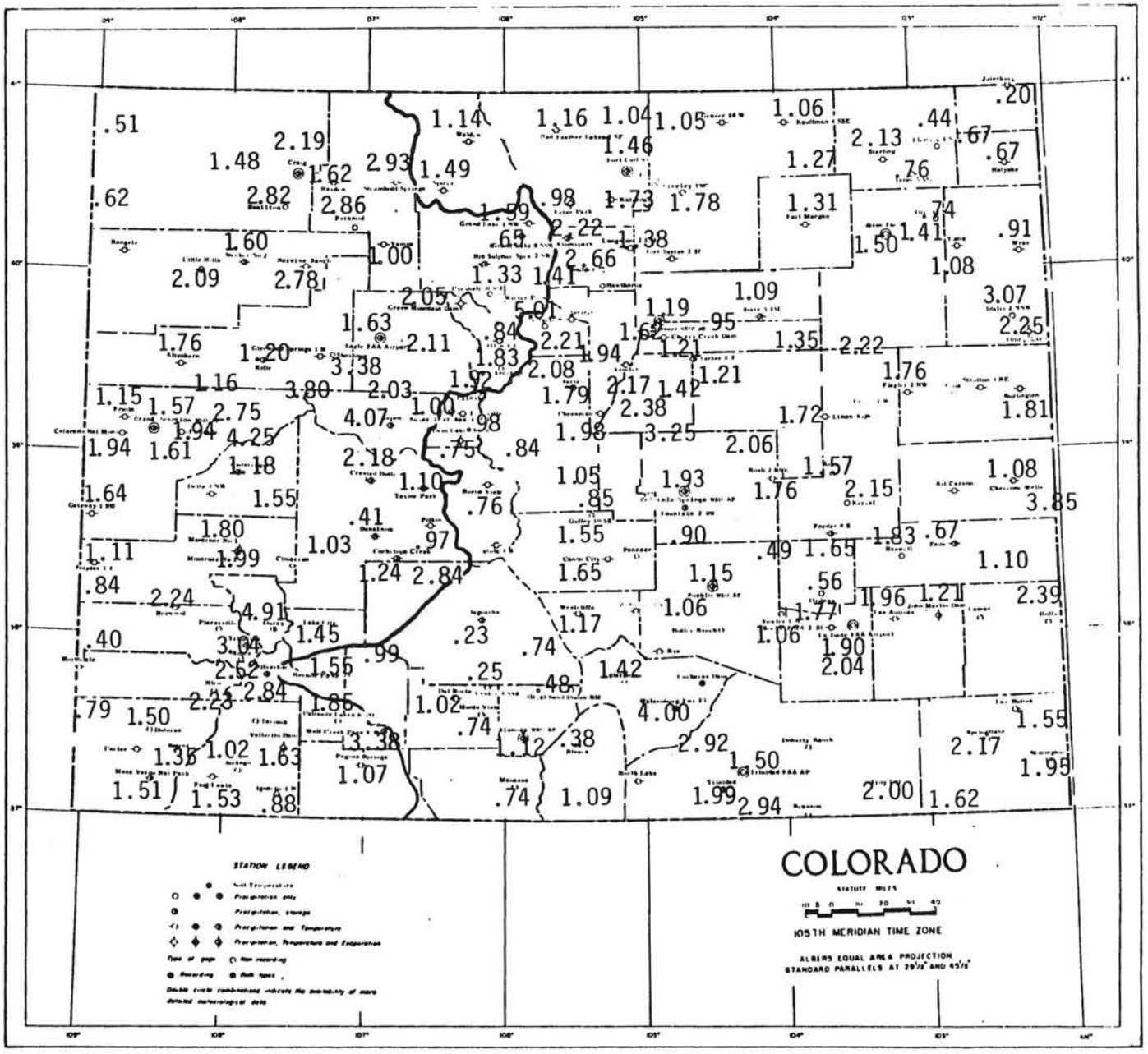

Figure 2. Precipitation for March 1984 as a percent of the 1961-1980 average.

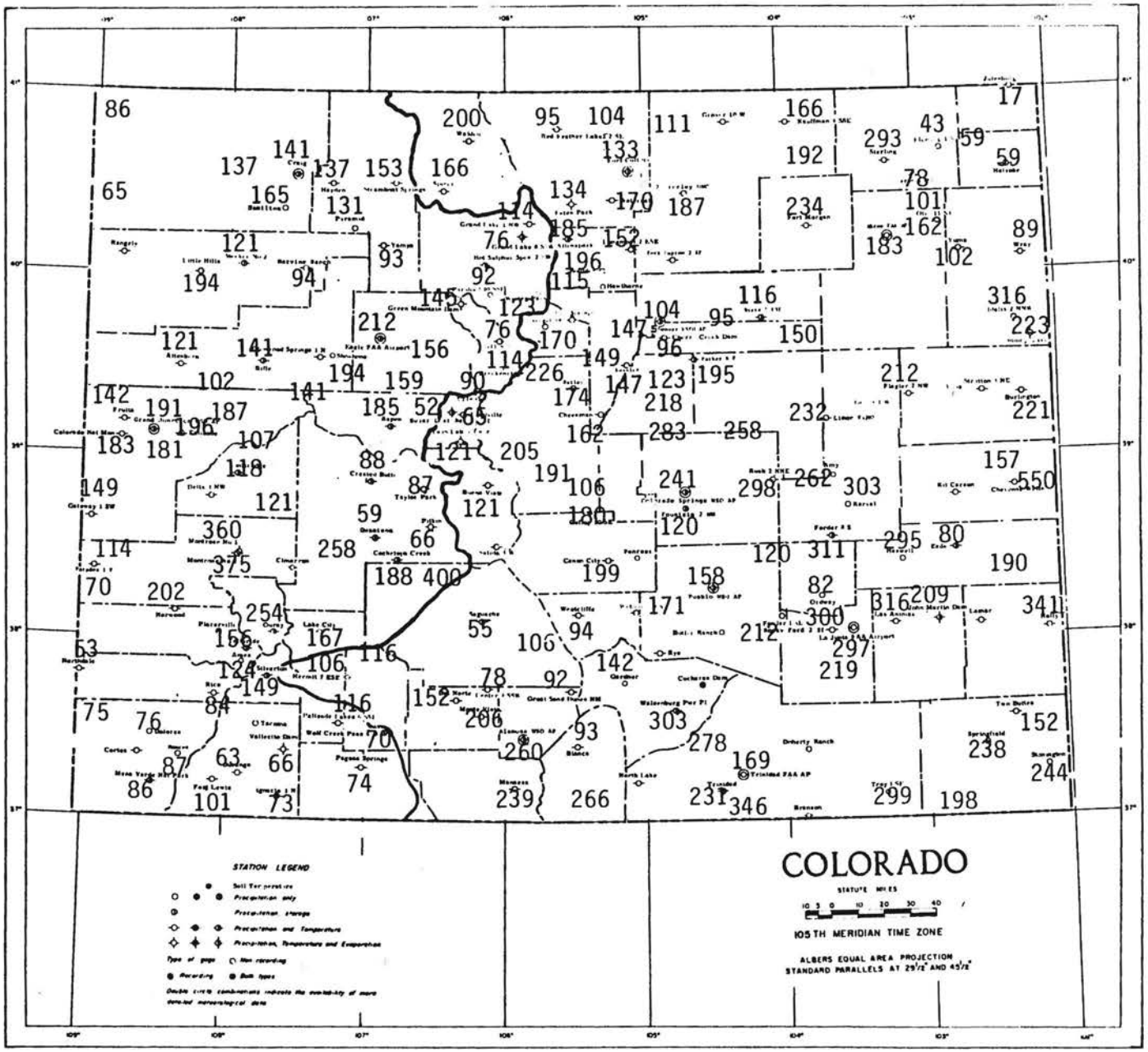

Figure 3. Precipitation for October 1983 through March 1984 as a percent of the 1961-1980 average.

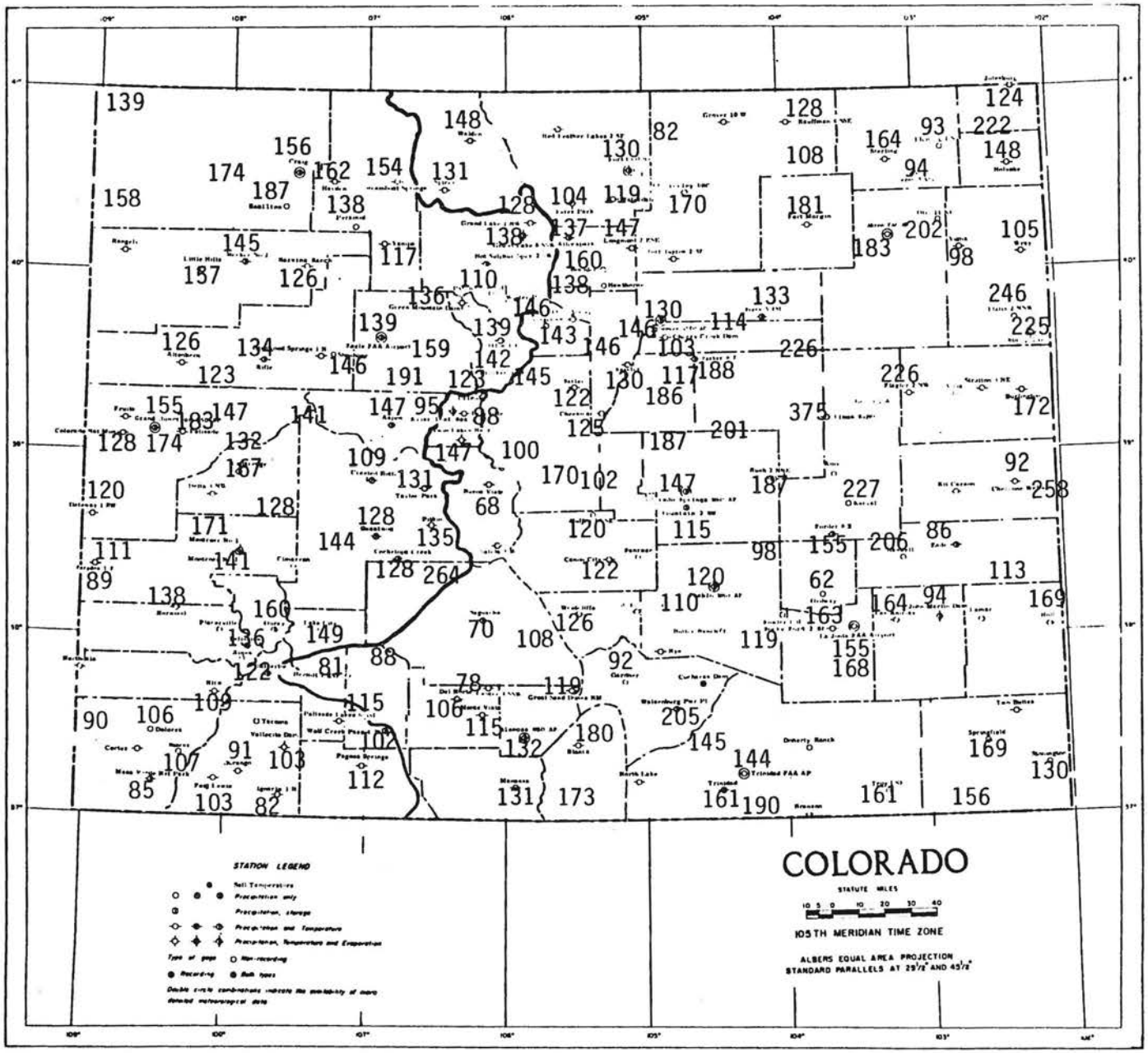

Figure 4. Temperatures for March 1984 in degrees Fahrenheit (in parentheses) and departures from the 1961-1980 average.

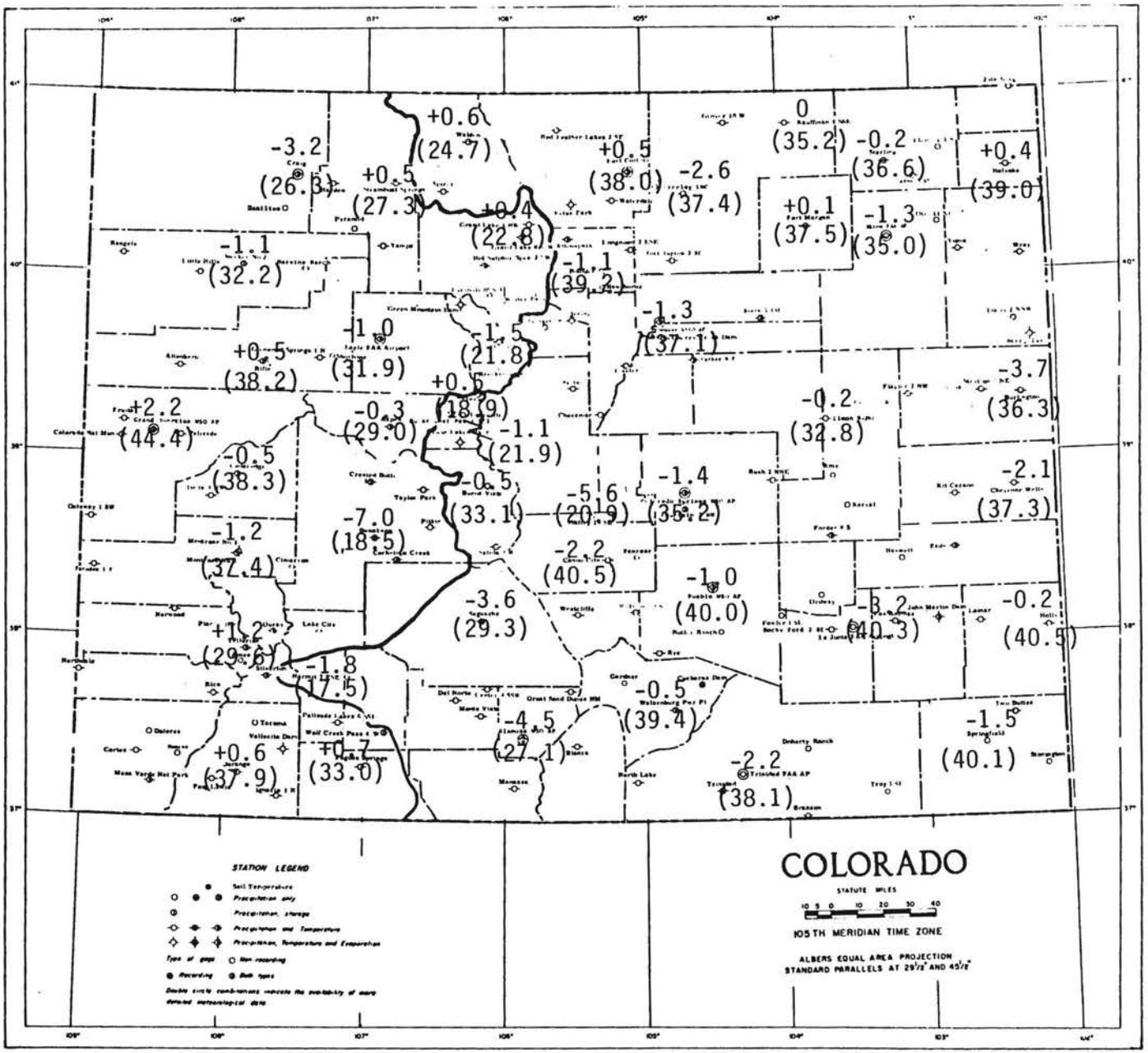

Table 1. Colorado Heating Degree Day Data through March 1984.

HEATING DEGREE DATA

STATION		JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	ANN
ALAMOSA	AVE	40	100	303	657	1074	1457	1519	1182	1035	732	453	165	8717
	82-83	59	47	274	714	1016	1361	1380	1080	945	856	556	249	8537
	83-84	28	35	213	674	1112	1581	1982	1566	1166				8357
ASPEN	AVE	95	150	348	651	1029	1339	1376	1162	1116	798	524	262	8850
	82-83	148	119	362	808	1105	1326	1301	1095	1066	959	691	350	9330
	83-84	97	86	269	622	1021	1392	1470	1200	1108				7265
BOULDER	AVE	0	6	130	357	714	908	1004	804	775	483	220	59	5460
	82-83	4	0	154	442	769	913	963	819	811	639	380	120	6014
	83-84	4	0	84	350	753	1367	1087	830	792				5267
BUENA VISTA	AVE	47	116	285	577	936	1184	1218	1025	983	720	459	184	7734
	82-83	47	70	284	745	798	1160	1105	995	990	897	547	266	7904
	83-84	45	49	234	595	970	1333	1331	1020	982				6559
BURLING-TON	AVE	6	5	108	364	762	1017	1110	871	803	459	200	38	5743
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CANON CITY	AVE	0	9	81	301	639	831	911	734	707	411	179	33	4836
	82-83	3	6	109	391	745	890	829	711	726	579	302	85	5376
	83-84	0	0	71	314	649	1278	993	760	752				4817
COLORADO SPRINGS	AVE	8	25	162	440	819	1042	1122	910	880	564	296	78	6346
	82-83	8	11	198	532	880	1084	1001	851	904	742	444	159	6814
	83-84	2	0	101	417	811	1438	1197	911	912				5789
CORTEZ	AVE	0	11	115	434	813	1132	1181	921	828	555	292	68	6350
	82-83	17	5	132	606	856	1148	1168	939	878	723	438	131	7041
	83-84	5	0	98	438	854	1154	1271	1018					4838
CRAIG	AVE	32	58	275	608	996	1342	1479	1193	1094	687	419	193	8376
	82-83	37	5	271	752	1116	1361	1305	1130	989	847	561	228	8602
	83-84	41	3	212	579	1005	1471	1730	1420	1194				7655
DELTA	AVE	0	0	94	394	813	1135	1197	890	753	429	167	31	5903
	82-83	2	4	81	496	777	1043	1040	753	686	513	272	66	5733
	83-84	0	0	60	340	727	1061	1366	1006	736				5296
DENVER	AVE	0	0	135	414	789	1004	1101	879	837	528	253	74	6014
	82-83	3	0	151	487	875	1050	1017	789	885	712	419	129	6517
	83-84	3	0	87	372	833	1466	1162	889	854				5666
DILLON	AVE	273	332	513	806	1167	1435	1516	1305	1296	972	704	435	10754
	82-83	318	253	511	959	1235	1450	1418	1265	1227	1158	842	496	11132
	83-84	263	224	438	789	1135	1492	1653	1419	1333				8746
DURANGO	AVE	9	34	193	493	837	1153	1218	958	862	600	366	125	6848
	82-83	24	6	175	614	874	1197	1130	909	850	735	405	147	7066
	83-84	3	0	124	464	899	1161	1289	1009	835				5784
EAGLE	AVE	33	80	288	626	1026	1407	1448	1148	1014	705	431	171	8377
	82-83	54	21	257	720	1059	1350	1273	974	880	846	529	219	8182
	83-84	30	3	203	579	962	1337	1681	1299	1015				7109
EVER-GREEN	AVE	59	113	327	621	916	1135	1199	1011	1009	730	489	218	7827
	82-83	110	41	339	733	1032	1184	940	979	1056	961	694	324	8393
	83-84	72	15	228	605	971	1449	1239	1040	1051				6670
FORT COLLINS	AVE	5	11	171	468	846	1073	1181	930	877	558	281	82	6483
	82-83	4	0	178	509	925	1082	968	787	830	715	389	127	6514
	83-84	2	0	115	415	843	1432	1225	887	829				5748
FORT MORGAN	AVE	0	6	140	438	867	1156	1283	969	874	516	224	47	6520
	82-83	3	3	123	492	895	1086	1050	804	798	663	346	108	6371
	83-84	0	0	77	368	782	1614	1493	998	844				6176
GRAND JUNCTION	AVE	0	0	65	325	762	1138	1225	882	716	403	148	19	5683
	82-83	2	0	61	397	704	983	946	668	586	482	239	22	5090
	83-84	0	0	27	208	678	1066	1366	958	630				4933

HEATING DEGREE DATA

STATION		JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	ANN
GRAND LAKE	AVE	214	264	468	775	1128	1473	1593	1369	1318	951	654	384	10591
	82-83	254	180	452	878	1236	1505	1489	1280	1219	1157	803	443	10896
	83-84	233	156	400	703	1052	1436	1743	1486	1301				8510
GREELEY	AVE	0	0	149	450	861	1128	1240	946	856	522	238	52	6442
	82-83	5	0	154	478	888	1075	988	770	806	688	379	113	6344
	83-84	3	0	72	375	843	1507	1344	955	848				5947
GUNNISON	AVE	111	188	393	719	1119	1590	1714	1422	1231	816	543	276	10122
	82-83	132	89	374	778	1146	1394	1379	1118	990	925	612	318	9255
	83-84	75	60	299	641	1128	1486	2112	1752	1435				8988
LAS ANIMAS	AVE	0	0	45	296	729	998	1101	820	698	348	102	9	5146
	82-83	0	0	43	313	758	978	1012	747	682	481	198	18	5230
	83-84	0	0	25	222	682	1357	1246	826	761				5119
LEAD-VILLE	AVE	272	337	522	817	1173	1435	1473	1318	1320	1038	726	439	10870
	82-83		323	540	974	1260	1426	1399	1259	1301	1220	886	544	11132
	83-84	308	316	488	832	1189	1529	1594	1389	1327				8972
LIMON	AVE	8	6	144	448	834	1070	1156	960	936	570	299	100	6531
	82-83	18	5	184	539	936	1124	1077	898	935	792	464	166	7138
	83-84	7	0	109	442	874	1491	1334	1057	986				6300
LONGMONT	AVE	0	6	162	453	843	1082	1194	938	874	546	256	78	6432
	82-83	7	0	164	517	894	1087	1001	809	836	664	406	128	6513
	83-84	1	0	91	382	849	1500	1357	915	868				5963
MEEKER	AVE	28	56	261	564	927	1240	1345	1086	998	651	394	164	7714
	82-83	33	7	245	657	998	1225	1157	1010	901	806	498	199	7736
	83-84	12	2	145	512	897	1298	1571	1217	1006				6660
MONTROSE	AVE	0	10	135	437	837	1159	1218	941	818	522	254	69	6400
	82-83	4	2	111	556	846	1104	1094	828	759	620	347	89	6360
	83-84	0	0	73	390	833	1147	1332	1049	848				5672
PAGOSA SPRINGS	AVE	82	113	297	608	981	1305	1380	1123	1026	732	487	233	8367
	82-83	76	29	253	732	938	1339	1274	1013	943	819	565	286	8266
	83-84	51	10	190	566	977	1306	1524	1219	986				6829
PUEBLO	AVE	0	0	89	346	744	998	1091	834	756	421	163	23	5465
	82-83	0	0	63	427	794	1010	974	833	740	561	258	50	5710
	83-84	0	0	52	330	689	1375	1183	834	765				5228
RIFLE	AVE	6	24	177	499	876	1249	1321	1002	856	555	298	82	6945
	82-83	8	3	150	596	871	1129	1082	833	738	669	394	107	6580
	83-84	3	0	86	430	835	1249	1445	1094	824				5966
STEAMBOAT SPRINGS	AVE	113	169	390	704	1101	1476	1541	1277	1184	810	533	297	9595
	82-83	146	80	368	791	1183	1482	1446	1146	1024	939	618	333	9556
	83-84	120	61	334	663	1071	1463	1725	1400	1162				7999
STERLING	AVE	0	6	157	462	876	1163	1274	966	896	528	235	51	6614
	82-83	3	3	154	518	933	1098	1046	762	827	674	363	111	6492
	83-84	1	0	98	392	801	1637	1412	973	871				6185
TELLURIDE	AVE	163	223	396	676	1026	1293	1339	1151	1141	849	589	318	9164
	82-83	139	140	364	746	1022	1265	1195	1042	1036	956	620	355	8880
	83-84	108	130	288	597	1012	1261	1383	1154	1092				7025
TRINIDAD	AVE	0	0	86	359	738	973	1051	846	781	468	207	35	5544
	82-83	0	0	66	367	705	949	956	779	730	619	318	66	5555
	83-84	0	0	55	291	698	1368	1111	834	828				5185
WALDEN	AVE	198	285	501	822	1170	1457	1535	1313	1277	915	642	351	10466
	82-83	201	141	469	878	1242	1441	1396	1173	1122	1052	761	391	10267
	83-84	156	114	387	759	1120	1534	1643	1417	1240				8370
WALSEN-BURG	AVE	0	8	102	370	720	924	989	820	781	501	210	49	5504
	82-83	0	1	95	400	714	927	880	719	763	627	314	92	5532
	83-84	0	0	87	310	683	1248	1001	801	789				4919

COLORADO CLIMATE -- APRIL 1984

Colorado Climate Center
Department of Atmospheric Science
Fort Collins, Colorado 80523

Spring was slow to arrive in Colorado as cold, snowy weather held a steady grip on the state. Increasing mountain snowpack indicated plentiful surface water supplies for the coming summer, but it also means the potential exists for spring and early summer flooding.

Significant Highlights -- April

Date	Event
1-3	Large, slow moving low pressure center drifted across southern Colorado bringing adverse weather to most of the state. The northeastern plains were hardest hit by the storm with snowfall amounts ranging from 6" at Greeley and Limon up to 14" at Sedgwick. Strong winds whipped the snow into huge drifts. Pueblo's winds on the 2nd averaged 28 mph.
4-8	Skies cleared and temperatures dropped. Many locations recorded their coldest readings of the month early on the 4th such as 17°F at Colorado Springs and Fort Collins, -2° at Leadville, and -10° at Walden. The -23° reading at Taylor Park Reservoir was the coldest in the state. Then a warming trend set in with temperatures reaching the 60s and 70s at lower elevations with 40s and 50s in the mountains. A rapidly moving storm passed south of Colorado on the 7th and triggered some scattered showers and even some thundershowers out on the plains. Precipitation was mostly light, but Sedalia picked up 0.63".
9-11	Two Pacific storm systems reached Colorado in rapid succession bringing cooler temperatures and widespread light to moderate precipitation. Heavier snowfall totals included 11" at Ouray, 17" at Breckenridge, and 20" at Berthoud Pass. Cheyenne Wells got .80" of rain early on the 10th.
12-17	Some lingering snows in the Northern and Central Mountains 12th and 13th. Otherwise a dry week across the state. Chilly and breezy 12-14 and then sunny and much warmer 16-17. The 17th was the warmest day of the month over the western 3/4 of the state with temperatures in the 70s both east and west of the mountains. High temperatures on the

17th included 50° at Climax, 68° at Estes Park, 78° at Montrose, and 85° at Pueblo, the highest in the state for April.

18-22 Major storm system developed over the southern Rockies bringing colder weather, snow, rain, wind, thunderstorms, and even a small tornado (near Windsor). Most of the state received some precipitation but the heaviest precipitation was confined to the northeast 1/4 of the state from the Continental Divide eastward to Kansas and Nebraska. Total storm precipitation exceeded one inch over most of this area with more than 2.00" near the foothills. One to three feet of snow made travel difficult. The Mount Evans Research station received 40" of snow in just over 48 hours (3.71" of moisture). Nederland measured 31.5" of snow from the storm. The Waterdale station just west of Loveland totalled 3.18" of moisture (18" snow) from the storm. Again, the northeast plains were hard hit by 6 to 18" of new snow. For some of these areas this was the 8th major snowstorm of the 1983-84 winter.

23-27 A brief respite 23-25th as a new and even more powerful storm began to develop west and north of Colorado. This storm just nicked Colorado on its way to burying Wyoming, Montana, and the Dakotas. Dinosaur, Maybell, Craig, and Steamboat Springs all received more than 1.00" precipitation before the storm moved northeast. Unseasonably cold air followed the storm and sent freezing temperatures to most of Colorado's Western Slope fruit growing areas. Temperatures down in the 20s caused widespread damage to the blossoming orchards. Many record lows were set on the 27th including 17° at Colorado Springs, 22° at Pueblo, and 12° at Cortez.

28-30 Continued cool and unsettled. Another storm passed south of Colorado setting off scattered heavy precipitation across southern portions of the state. Wolf Creek Pass received 27" of new snow. Canon City and Burlington were surprised by a 10" snowfall on the 28th. Walsh and Stonington in extreme southeastern Colorado received 1.15" and 1.30" of rain, respectively.

Precipitation Summary

Precipitation totals and percents of average for April are shown in Figures 1 and 2. Totals ranged from just 0.12" (26% of average) at Blue Mesa Lake and 0.14" (44% of average) at Center to 5.95" (389% of average) near Idalia and 6.81" (160%) at Berthoud Pass. Mount Evans Research station (not on the map) totalled 7.85" for the month. Practically all of Colorado was wetter than average in April, but as

usual there was a lot of local variations. The wettest areas, compared to average, were the Yampa Valley, the upper Colorado, the Grand Junction area, scattered parts of the San Juans, the Front Range north of Longmont, and most of the Eastern Plains. From Stonington to Julesburg most every station received 2 to 4 times the average precipitation. Near or below average precipitation was limited to an area in the middle of the state from Montrose to Leadville and on to Lakewood and also the San Luis Valley eastward to Pueblo and Trinidad.

Water-Year Precipitation to Date

Precipitation since October 1, 1983 continues to be well above average over almost the entire state. There are no significant areas with below average precipitation. This abundant moisture and the high mountain snowpack pose some threat for spring flooding, should periods of very warm temperatures persist in May and June.

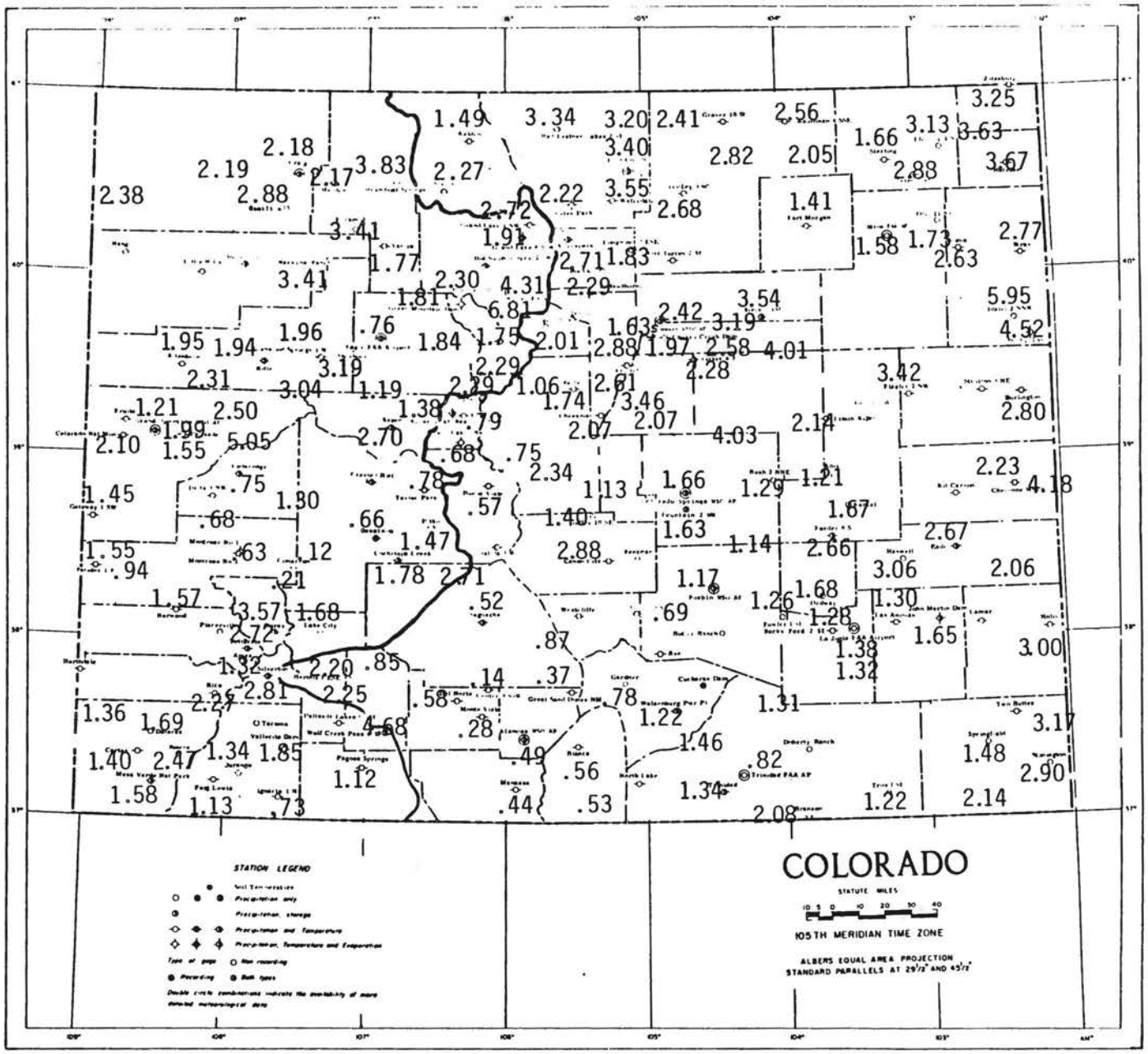
Temperature Summary

All of Colorado was colder than average in April with little difference east or west of the Continental Divide. On the whole, the Eastern Plains were about 5 degrees below average which occurs about 1 year in 12. Burlington, however, was 8.8 degrees below average--their 2nd coldest April on record since 1902. West of the mountains, temperatures ranged from 6.4 degrees below average at Craig to only 1.4 degrees below average at Pagosa Springs. In the western half of the state this was the 4th consecutive below average month.

Heating Degree Days

Table 1 shows comparative heating degree day information for a number of Colorado cities. With the unseasonably cold temperatures, heating degree day totals were above average across the state. Most locations received 15 to 30% more heating degree days than in an average April. Burlington's 700 total was 53% above average. However, when compared to April 1983, this year didn't look so bad. Most locations received 2 to 10% fewer degree days than they did last April. This means that even with our cold temperatures this month, heating bills shouldn't be much different and may be a little less than last year.

Figure 1. April 1984 precipitation amounts (inches).



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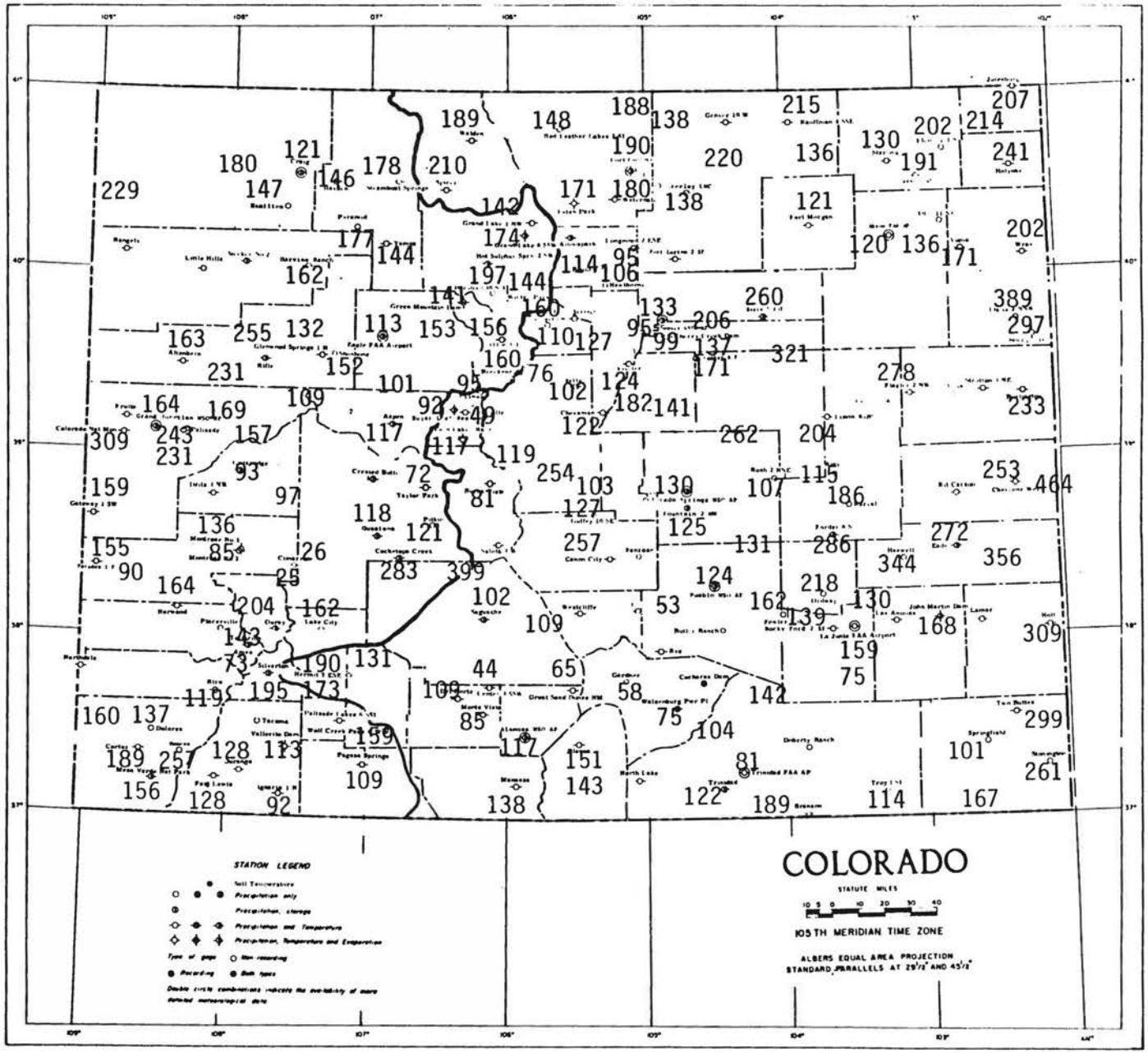

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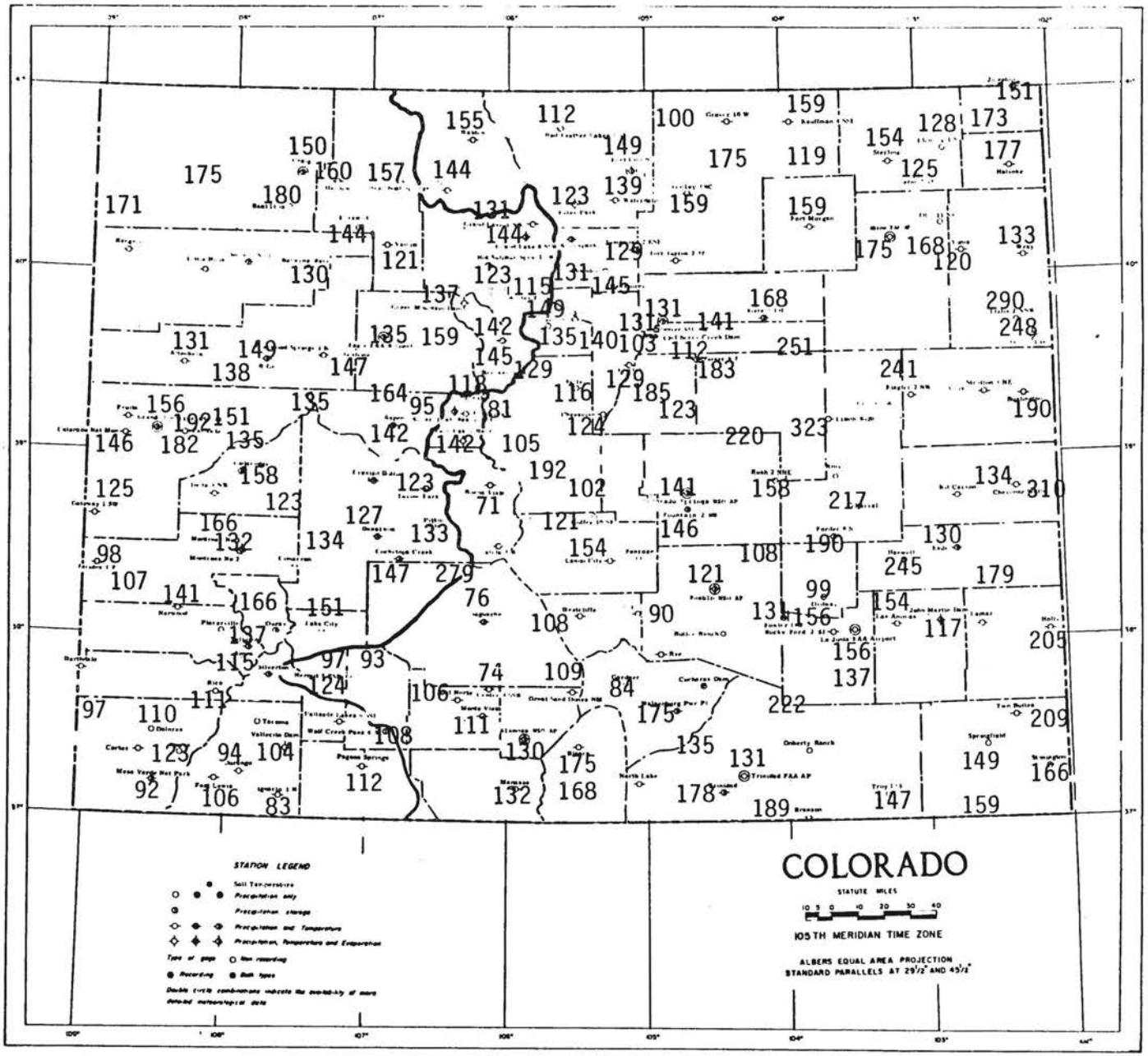

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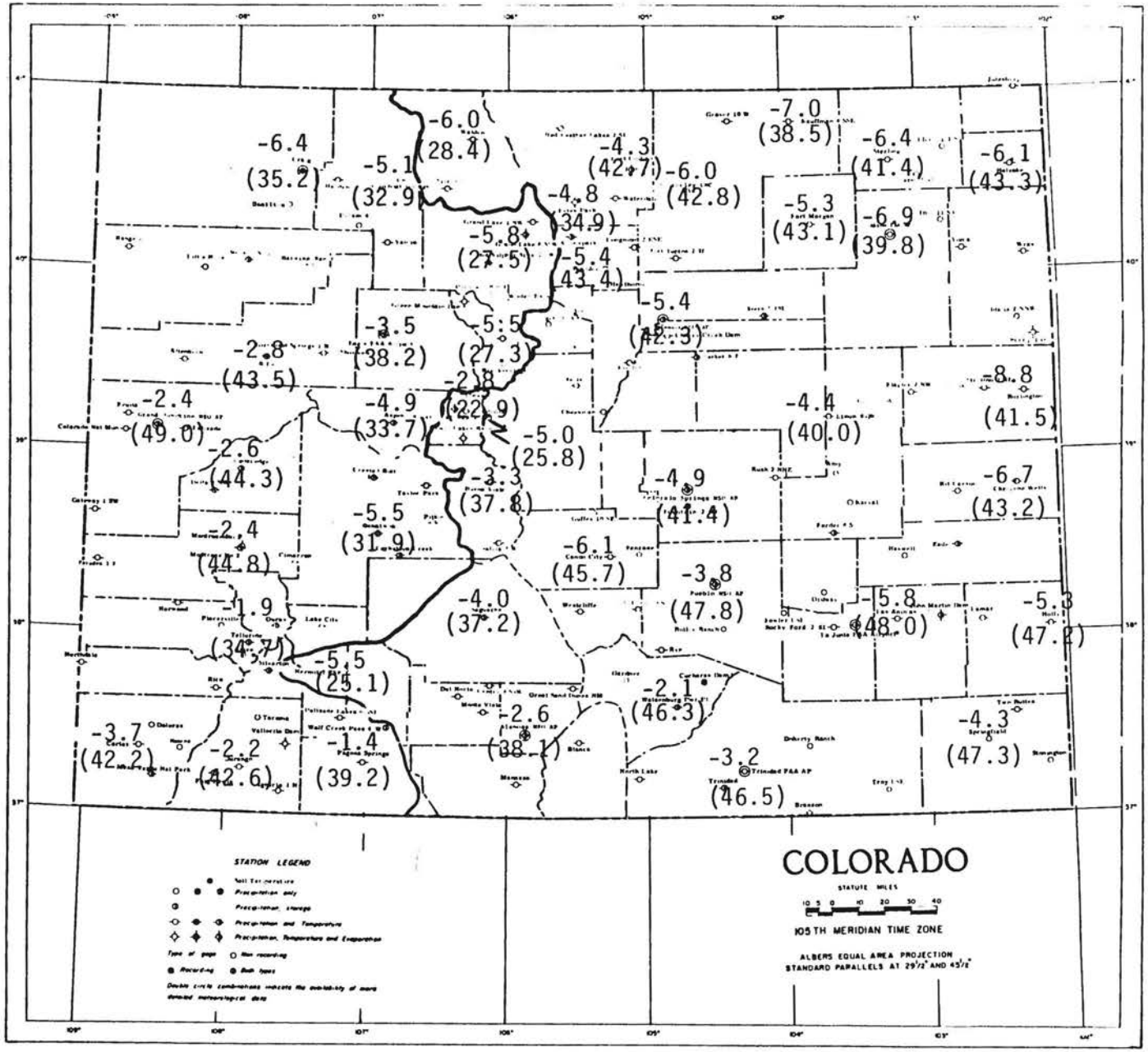

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	82-83	4	0	154	442	769	913	963	819	811	639	380	120	6014
	83-84	4	0	84	350	753	1367	1087	830	792	639			5906
BUENA VISTA	AVE	47	116	285	577	936	1184	1218	1025	983	720	459	184	7734
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	83-84	45	49	234	595	970	1333	1331	1020	982	808			7367
BURLING-TON	AVE	6	5	108	364	762	1017	1110	871	803	459	200	38	5743
	82-83	0	5	99	405	818	999	1006	784	832	637	339	81	6005
	83-84	0	0	87	359	758	1500	1172	884	883	700			6343
CANON CITY	AVE	0	9	81	301	639	831	911	734	707	411	179	33	4836
	82-83	3	6	109	391	745	890	829	711	726	579	302	85	5376
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COLORADO SPRINGS	AVE	8	25	162	440	819	1042	1122	910	880	564	296	78	6346
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	83-84	5	0	98	438	854	1154	1271	1018		677			5515
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	83-84	0	0	60	340	727	1061	1366	1006	736	505			5801
DENVER	AVE	0	0	135	414	789	1004	1101	879	837	528	253	74	6014
	82-83	3	0	151	487	875	1050	1017	789	885	712	419	129	6517
	83-84	3	0	87	372	833	1466	1162	889	854	673			6339
DILLON	AVE	273	332	513	806	1167	1435	1516	1305	1296	972	704	435	10754
	82-83	318	253	511	959	1235	1450	1418	1265	1227	1158	842	496	11132
	83-84	263	224	438	789	1135	1492	1653	1419	1333	1124			9870
DURANGO	AVE	9	34	193	493	837	1153	1218	958	862	600	366	125	6848
	82-83	24	6	175	614	874	1197	1130	909	850	735	405	147	7066
	83-84	3	0	124	464	899	1161	1289	1009	835	665			6449
EAGLE	AVE	33	80	288	626	1026	1407	1448	1148	1014	705	431	171	8377
	82-83	54	21	257	720	1059	1350	1273	974	880	846	529	219	8182
	83-84	30	3	203	579	962	1337	1681	1299	1015	798			7907
EVER-GREEN	AVE	59	113	327	621	916	1135	1199	1011	1009	730	489	218	7827
	82-83	110	41	339	733	1032	1184	940	979	1056	961	694	324	8393
	83-84	72	15	228	605	971	1449	1239	1040	1051	864			7534
FORT COLLINS	AVE	5	11	171	468	846	1073	1181	930	877	558	281	82	6483
	82-83	4	0	178	509	925	1082	968	787	830	715	389	127	6514
	83-84	2	0	115	415	843	1432	1225	887	829	661			6409
FORT MORGAN	AVE	0	6	140	438	867	1156	1283	969	874	516	224	47	6520
	82-83	3	3	123	492	895	1086	1050	804	798	663	346	108	6371
	83-84	0	0	77	368	782	1614	1493	998	844	650			6826
GRAND JUNCTION	AVE	0	0	65	325	762	1138	1225	882	716	403	148	19	5683
	82-83	2	0	61	397	704	983	946	668	586	482	239	22	5090
	83-84	0	0	27	208	678	1066	1366	958	630	474			5407

HEATING DEGREE DATA

STATION		JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	ANN
GRAND LAKE	AVE	214	264	468	775	1128	1473	1593	1369	1318	951	654	384	10591
	82-83	254	180	452	878	1236	1505	1489	1280	1219	1157	803	443	10896
	83-84	233	156	400	703	1052	1436	1743	1486	1301	1120			9630
GREELEY	AVE	0	0	149	450	861	1128	1240	946	856	522	238	52	6442
	82-83	5	0	154	478	888	1075	988	770	806	688	379	113	6344
	83-84	3	0	72	375	843	1507	1344	955	848	661			6608
GUNNISON	AVE	111	188	393	719	1119	1590	1714	1422	1231	816	543	276	10122
	82-83	132	89	374	778	1146	1394	1379	1118	990	925	612	318	9255
	83-84	75	60	299	641	1128	1486	2112	1752	1435	986			9974
LAS ANIMAS	AVE	0	0	45	296	729	998	1101	820	698	348	102	9	5146
	82-83	0	0	43	313	758	978	1012	747	682	481	198	18	5230
	83-84	0	0	25	222	682	1357	1246	826	761	502			5621
LEAD-VILLE	AVE	272	337	522	817	1173	1435	1473	1318	1320	1038	726	439	10870
	82-83		323	540	974	1260	1426	1399	1259	1301	1220	886	544	11132
	83-84	308	316	488	832	1189	1529	1594	1389	1327	1171			10143
LIMON	AVE	8	6	144	448	834	1070	1156	960	936	570	299	100	6531
	82-83	18	5	184	539	936	1124	1077	898	935	792	464	166	7138
	83-84	7	0	109	442	874	1491	1334	1057	986	743			7043
LONGMONT	AVE	0	6	162	453	843	1082	1194	938	874	546	256	78	6432
	82-83	7	0	164	517	894	1087	1001	809	836	664	406	128	6513
	83-84	1	0	91	382	849	1500	1357	915	868	688			6651
MEEKER	AVE	28	56	261	564	927	1240	1345	1086	998	651	394	164	7714
	82-83	33	7	245	657	998	1225	1157	1010	901	806	498	199	7736
	83-84	12	2	145	512	897	1298	1571	1217	1006				6660
MONTROSE	AVE	0	10	135	437	837	1159	1218	941	818	522	254	69	6400
	82-83	4	2	111	556	846	1104	1094	828	759	620	347	89	6360
	83-84	0	0	73	390	833	1147	1332	1049	848	598			6270
PAGOSA SPRINGS	AVE	82	113	297	608	981	1305	1380	1123	1026	732	487	233	8367
	82-83	76	29	253	732	938	1338	1274	1013	943	819	565	286	8266
	83-84	51	10	190	566	977	1306	1524	1219	986	768			7597
PUEBLO	AVE	0	0	89	346	744	998	1091	834	756	421	163	23	5465
	82-83	0	0	63	427	794	1010	974	833	740	561	258	50	5710
	83-84	0	0	52	330	689	1375	1183	834	765	507			5735
RIFLE	AVE	6	24	177	499	876	1249	1321	1002	856	555	298	82	6945
	82-83	8	3	150	596	871	1129	1082	833	738	669	394	107	6580
	83-84	3	0	86	430	835	1249	1445	1094	824	639			6605
STEAMBOAT SPRINGS	AVE	113	169	390	704	1101	1476	1541	1277	1184	810	533	297	9595
	82-83	146	80	368	791	1183	1482	1446	1146	1024	939	618	333	9556
	83-84	120	61	334	663	1071	1463	1725	1400	1162	957			8956
STERLING	AVE	0	6	157	462	876	1163	1274	966	896	528	235	51	6614
	82-83	3	3	154	518	933	1098	1046	762	827	674	363	111	6492
	83-84	1	0	98	392	801	1637	1412	973	871	699			6884
TELLURIDE	AVE	163	223	396	676	1026	1293	1339	1151	1141	849	589	318	9164
	82-83	139	140	364	746	1022	1265	1195	1042	1036	956	620	355	8880
	83-84	108	130	288	597	1012	1261	1383	1154	1092	900			7925
TRINIDAD	AVE	0	0	86	359	738	973	1051	846	781	468	207	35	5544
	82-83	0	0	66	367	705	949	956	779	730	619	318	66	5555
	83-84	0	0	55	291	698	1368	1111	834	828	548			5733
WALDEN	AVE	198	285	501	822	1170	1457	1535	1313	1277	915	642	351	10466
	82-83	201	141	469	878	1242	1441	1396	1173	1122	1052	761	391	10267
	83-84	156	114	387	759	1120	1534	1643	1417	1240	1090			9460
WALSEN-BURG	AVE	0	8	102	370	720	924	989	820	781	501	240	49	5504
	82-83	0	1	95	400	714	927	880	719	763	627	314	92	5532
	83-84	0	0	87	310	683	1248	1001	801	789	552			5471

COLORADO CLIMATE -- MAY 1984

Colorado Climate Center
Department of Atmospheric Science
Fort Collins, Colorado 80523

Warmer and drier than average conditions prevailed across most of the state for the first time since October 1983. The warm temperatures hurried the snowmelt and helped produce mud and rock slides and large scale flooding in parts of western Colorado.

Significant Highlights -- May

Date	Event
1-7	Cool and unsettled period statewide as the jet stream position remained just south of Colorado. Showers fell each day over the extreme Eastern Plains and over much of the Northern and Central Mountains where the snow line dipped to about 6,500 feet. While most showers were light, there were some locally heavy storms. Steamboat Springs, Hayden, Meeker, Rifle, Glenwood Springs and Akron all reported at least 0.50" on the 2nd. The heaviest precipitation of the month fell on the 5th and 6th. Aspen and Climax each received 1.00" of water equivalent with 8" and 9" of new snow, respectively. The snow depth at Berthoud Pass reached 111" on the morning of the 7th. Springfield and Stonington reported the most precipitation in 24 hours, 1.90" and 2.28" respectively on the 5th.
8	Skies cleared as a large ridge of high pressure covered the western U.S. Most stations in Colorado had their coldest temperature of the month that morning. Minimums ranged from 37°F at Grand Junction and 34° at Denver to 11° at Leadville and Dillon and -5° at Taylor Park Reservoir, the coldest in the state. It was the last frost of the spring for much of the lower elevation agricultural areas.
9-16	Dry, windy and unseasonably warm as a high pressure ridge aloft covered Colorado. The spring snowmelt began with a bang as rivers and streams rose rapidly and mudslides closed some roads and threatened mountain resorts. Daytime temperatures soared into the 60s and 70s in the mountains with 80s and a few 90s at lower elevations. Even nighttime temperatures stayed above freezing in many mountain areas. Only a few showers were noted during the period and mostly in the southern part of the state. Las Animas received 0.85" of rain and hail late on the 13th and Fowler totalled 0.92". Pagosa Springs got 0.41" of rain late on the 15th.

17-19 A return to seasonal temperatures statewide with daily showers east of the mountains. Rainfall was again quite light although a few storms dropped more than 0.50" of rain. Sterling reported 0.75" on the 18th.

20-23 Dry and very warm in the western half of Colorado. Rapid snowmelt produced serious flooding along portions of several major rivers including the Gunnison, Uncompahgre, Colorado, and the Arkansas. On the 23rd the temperature reached 82° at Gunnison, 89° at Durango, and 95° at Palisade. East of the mountains, cooler air slipped into the state on the 21st and 22nd and temperatures in northeastern Colorado stayed in the 60s on the 22nd. A few thunderstorms rumbled across the northeast plains. Fort Collins' 0.82" on the 21st was the heaviest report. Temperatures warmed quickly on the 23rd in advance of a cold front.

24-28 Cooler air brought showers and high mountain snows across the northern half of the state on the 24th. Meanwhile new record highs were set in the southeast including 93° at Colorado Springs, 97° at Pueblo, and 98° south of La Junta. Cooler air slowed the snowmelt a bit and most of the major western slope rivers reached peak flows on the 25th. Temperatures remained mild west of the mountains but were comfortably cool to the east.

29-31 Unseasonably warm again with temperatures in the 80s and 90s at lower elevations. More record highs were set on the 30th. A little cooler on the 31st as showers began to invade the state. Glenwood Springs received 1.00" of rain in a downpour. Before the cooler air arrived, Lamar's temperature managed to reach 100° on the 31st, the warmest in the state in May.

Precipitation Summary

Precipitation totals and percents of average are shown in Figures 1 and 2. Most of Colorado was significantly drier than average in May for the first time in at least 7 years. The driest areas were the northwest and southwest corners of the state and the areas just east of the Front Range and eastern foothills from Wyoming to New Mexico. Boulder totalled a mere 0.45" for the month, just 15% of average. Canon City reported just 0.05", 3% of average.

There were only a few areas receiving near average or above average precipitation. These included the Colorado River Valley from Palisade to Grand Lake, the mountains from Gunnison to Berthoud Pass, a small area near Montrose, and scattered areas from Pueblo southeastward to Oklahoma. Stonington's 4.08" total, 161% of average, was the greatest in the state.

Water-Year Precipitation to Date

Despite the dry month of May, precipitation totals since October 1, 1983 are well above average over most of Colorado. There are still a number of stations where precipitation has been at least 150% of average. The driest area of the state is the southwest from the northern San Luis Valley across to Durango where precipitation has ranged from near to slightly below average.

Temperature Summary

It was a warm month across practically all of the state with most stations 2 to 5 degrees Fahrenheit warmer than average. The only near average areas were in extreme eastern Colorado and in the Central Mountains. The warmest areas compared to average were in the western half of the state where warm temperatures were instrumental in creating the mud and flood problems which developed.

Degree Days

During the months of May through September degree day tables of both heating (Tablel 1) and cooling (Table 2) degree days will be presented (base 65°F) but with no special narrative discussion.

Growing Degree Days

Because of interest shown by some of our agricultural readers we are introducing a new map. From now through September a map (Figure 5) of growing degree days (GDD) for selected stations will be presented showing the monthly total of corn growing degree days using the definition:

> Mean daily temperature (°F) - 50°F = GDD summed for each day of the month. Any minimum temperature less than 50° is counted as 50° and any maximum temperature greater than 86° is counted as 86° in calculating the daily mean temperature, $(T_{max} + T_{min})/2$.

Please let us know what you think of this information. Your comments and suggestions are always welcome.

Figure 1. May 1984 precipitation amounts (inches).

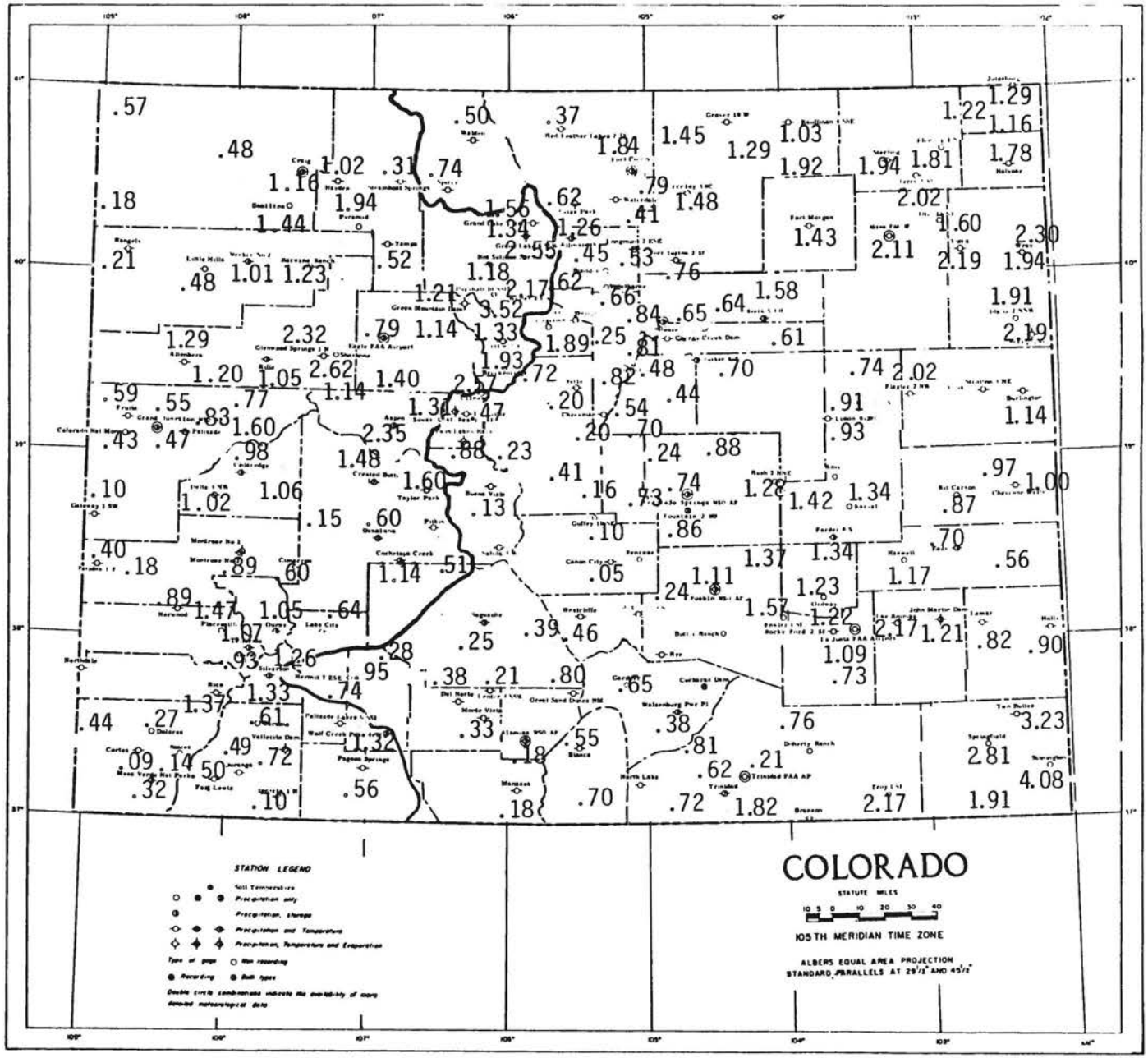

Figure 2. Precipitation for May 1984 as a percent of the 1961-1980 average.

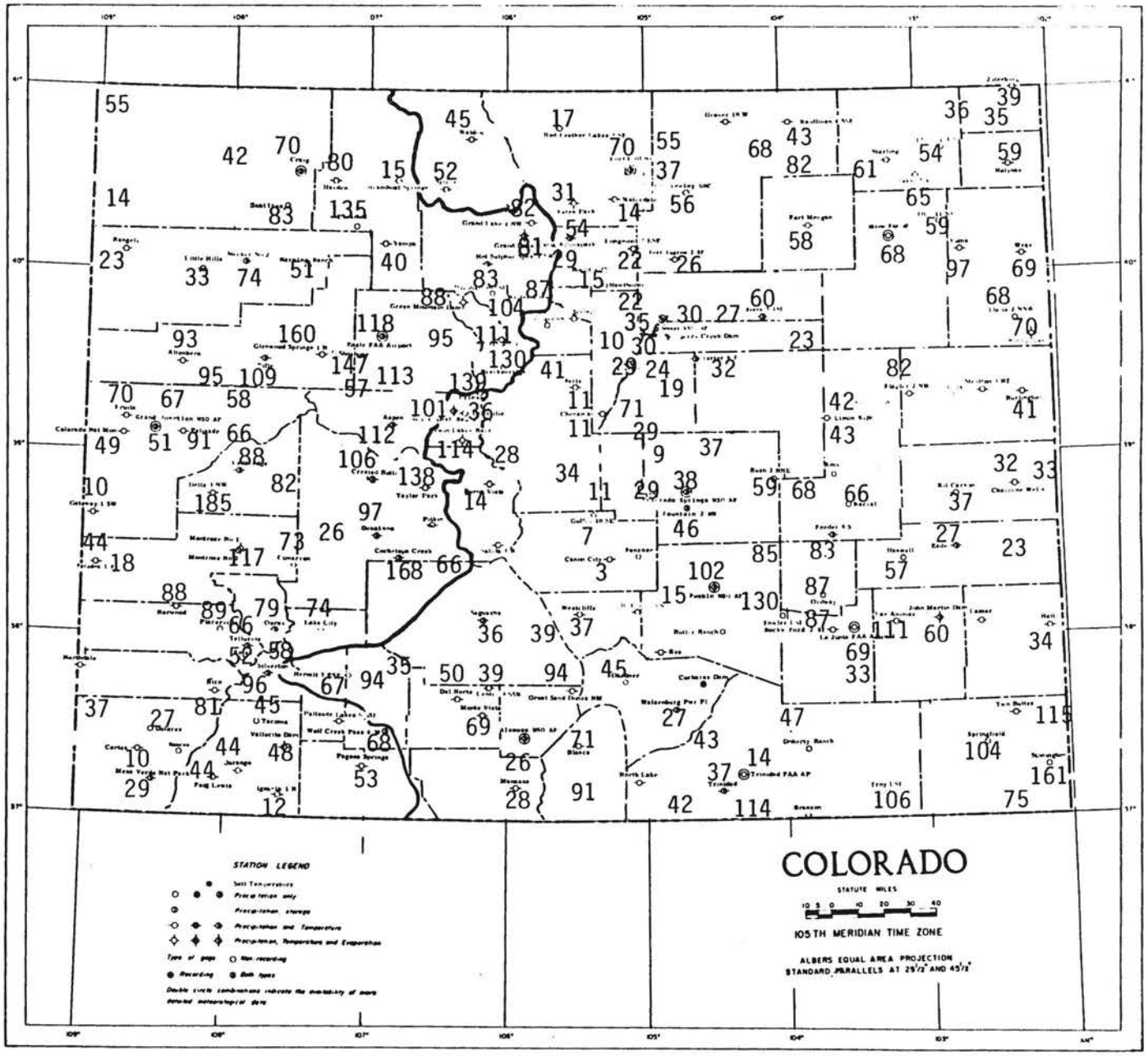

Figure 3. Precipitation for October 1983 through May 1984 as a percent of the 1961-1980 average.

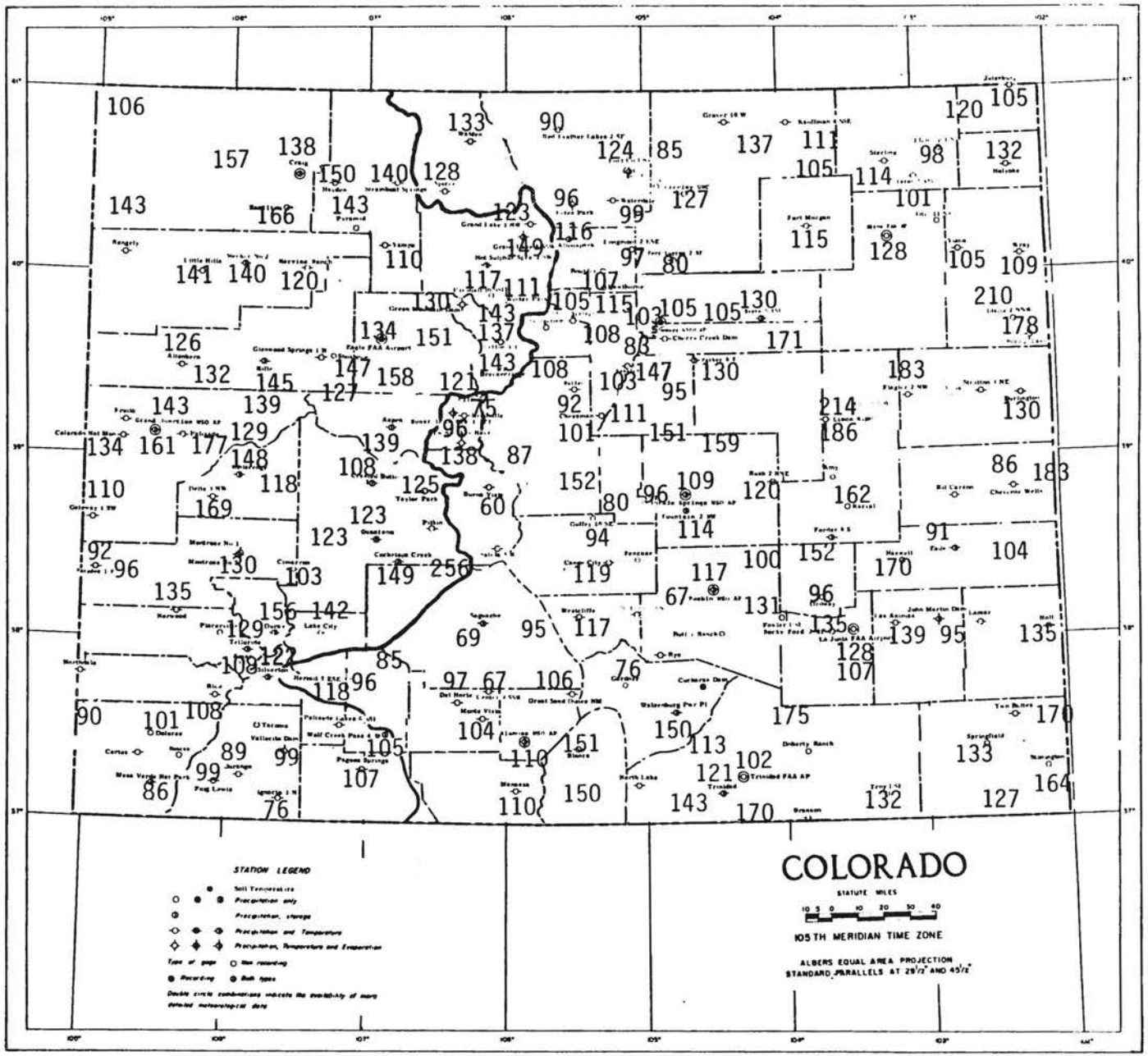

Figure 4. Temperatures for May 1984 in degrees Fahrenheit (in parentheses) and departures from the 1961-1980 average.

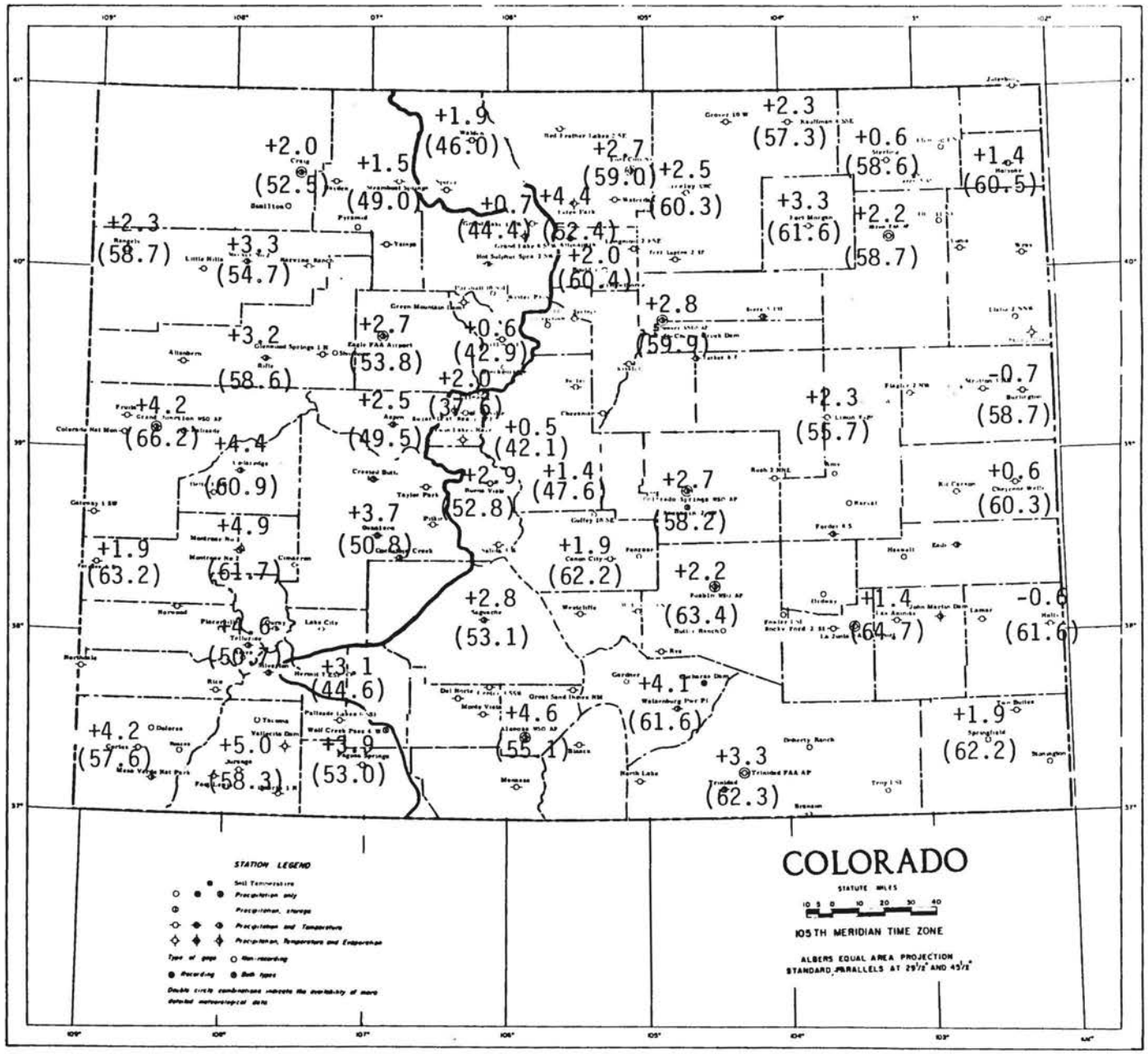

Figure 5. May 1984 growing degree days (see text for definition).

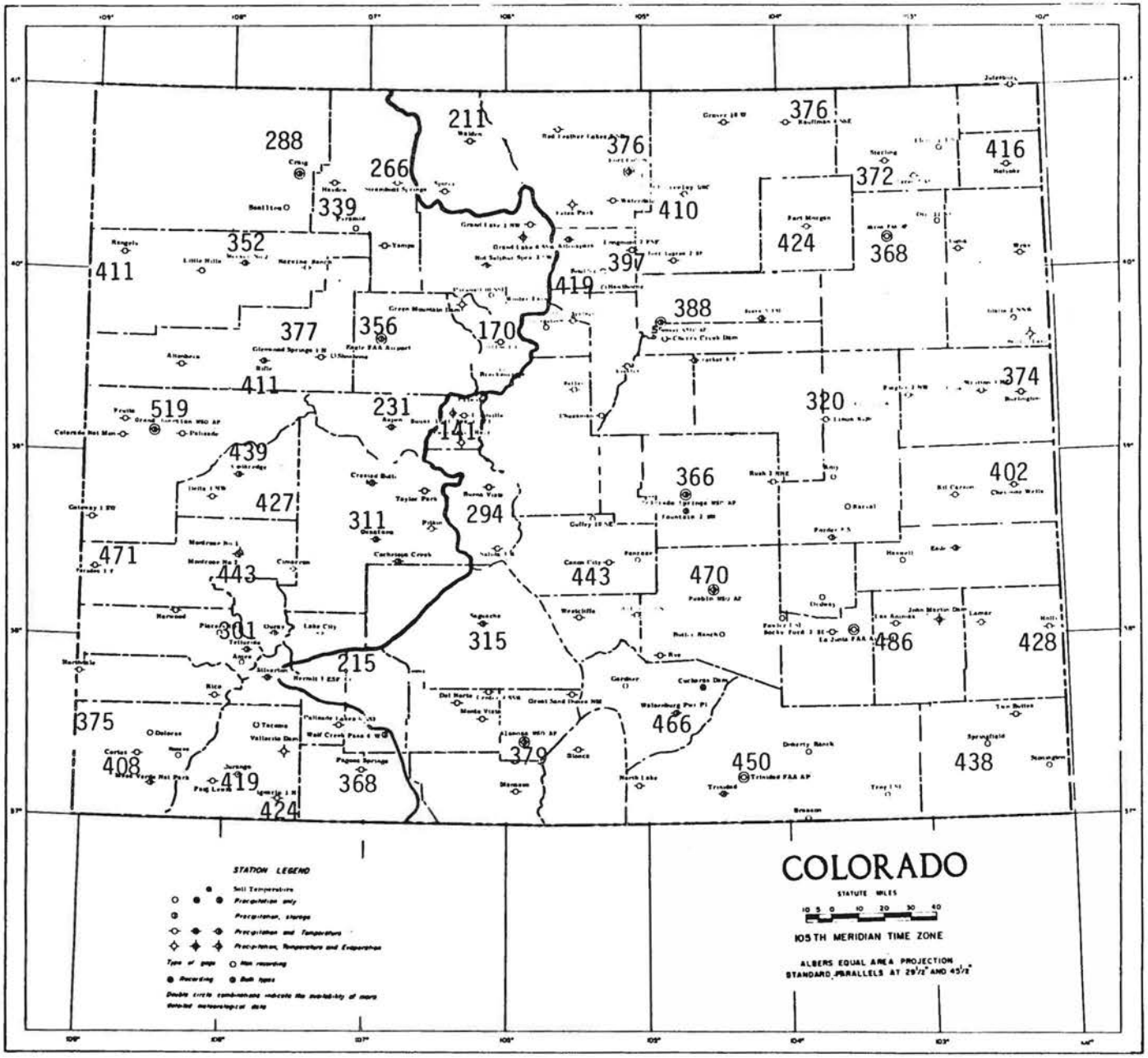

Table 1. Colorado Heating Degree Day Data through May 1984.

HEATING DEGREE DATA

STATION		JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	ANN
ALAMOSA	AVE	40	100	303	657	1074	1457	1519	1182	1035	732	453	165	8717
	82-83	59	47	274	714	1016	1361	1380	1080	945	856	556	249	8537
	83-84	28	35	213	674	1112	1581	1982	1566	1166	799	300		9456
ASPEN	AVE	95	150	348	651	1029	1339	1376	1162	1116	798	524	262	8850
	82-83	148	119	362	808	1105	1326	1301	1095	1066	959	691	350	9330
	83-84	97	86	269	622	1021	1392	1470	1200	1108	932	477		8674
BOULDER	AVE	0	6	130	357	714	908	1004	804	775	483	220	59	5460
	82-83	4	0	154	442	769	913	963	819	811	639	380	120	6014
	83-84	4	0	84	350	753	1367	1087	830	792	639	168		6074
BUENA VISTA	AVE	47	116	285	577	936	1184	1218	1025	983	720	459	184	7734
	82-83	47	70	284	745	798	1160	1105	995	990	897	547	266	7904
	83-84	45	49	234	595	970	1333	1331	1020	982	808	370		7737
BURLING-TON	AVE	6	5	108	364	762	1017	1110	871	803	459	200	38	5743
	82-83	0	5	99	405	818	999	1006	784	832	637	339	81	6005
	83-84	0	0	87	359	758	1500	1172	884	883	700	200		6543
CANON CITY	AVE	0	9	81	301	639	831	911	734	707	411	179	33	4836
	82-83	3	6	109	391	745	890	829	711	726	579	302	85	5376
	83-84	0	0	71	314	649	1278	993	760	752	570	134		5521
COLORADO SPRINGS	AVE	8	25	162	440	819	1042	1122	910	880	564	296	78	6346
	82-83	8	11	198	532	880	1084	1001	851	904	742	444	159	6814
	83-84	2	0	101	417	811	1438	1197	911	912	700	220		6709
CORTEZ	AVE	0	11	115	434	813	1132	1181	921	828	555	292	68	6350
	82-83	17	5	132	606	856	1148	1168	939	878	723	438	131	7041
	83-84	5	0	98	438	854	1154	1271	1018		677	239		5754
CRAIG	AVE	32	58	275	608	996	1342	1479	1193	1094	687	419	193	8376
	82-83	37	5	271	752	1116	1361	1305	1130	989	847	561	228	8602
	83-84	41	3	212	579	1005	1471	1730	1420	1194	884	383		8922
DELTA	AVE	0	0	94	394	813	1135	1197	890	753	429	167	31	5903
	82-83	2	4	81	496	777	1043	1040	753	686	513	272	66	5733
	83-84	0	0	60	340	727	1061	1366	1006	736	505	135		5936
DENVER	AVE	0	0	135	414	789	1004	1101	879	837	528	253	74	6014
	82-83	3	0	151	487	875	1050	1017	789	885	712	419	129	6517
	83-84	3	0	87	372	833	1466	1162	889	854	673	183		6522
DILLON	AVE	273	332	513	806	1167	1435	1516	1305	1296	972	704	435	10754
	82-83	318	253	511	959	1235	1450	1418	1265	1227	1158	842	496	11132
	83-84	263	224	438	789	1135	1492	1653	1419	1333	1124	675		10545
DURANGO	AVE	9	34	193	493	837	1153	1218	958	862	600	366	125	6848
	82-83	24	6	175	614	874	1197	1130	909	850	735	405	147	7066
	83-84	3	0	124	464	899	1161	1289	1009	835	665	209		6658
EAGLE	AVE	33	80	288	626	1026	1407	1448	1148	1014	705	431	171	8377
	82-83	54	21	257	720	1059	1350	1273	974	880	846	529	219	8182
	83-84	30	3	203	579	962	1337	1681	1299	1015	798	338		8245
EVER-GREEN	AVE	59	113	327	621	916	1135	1199	1011	1009	730	489	218	7827
	82-83	110	41	339	733	1032	1184	940	979	1056	961	694	324	8393
	83-84	72	15	228	605	971	1449	1239	1040	1051	864	375		7909
FORT COLLINS	AVE	5	11	171	468	846	1073	1181	930	877	558	281	82	6483
	82-83	4	0	178	509	925	1082	968	787	830	715	389	127	6514
	83-84	2	0	115	415	843	1432	1225	887	829	661	196		6605
FORT MORGAN	AVE	0	6	140	438	867	1156	1283	969	874	516	224	47	6520
	82-83	3	3	123	492	895	1086	1050	804	798	663	346	108	6371
	83-84	0	0	77	368	782	1614	1493	998	844	650	158		6994
GRAND JUNCTION	AVE	0	0	65	325	762	1138	1225	882	716	403	148	19	5683
	82-83	2	0	61	397	704	983	946	668	586	482	239	22	5090
	83-84	0	0	27	208	678	1066	1366	958	630	474	89		5496

HEATING DEGREE DATA

STATION		JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	ANN
GRAND LAKE	AVE	214	264	468	775	1128	1473	1593	1369	1318	951	654	384	10591
	82-83	254	180	452	878	1236	1505	1489	1280	1219	1157	803	443	10896
	83-84	233	156	400	703	1052	1436	1743	1486	1301	1120	630		10260
GREELEY	AVE	0	0	149	450	861	1128	1240	946	856	522	238	52	6442
	82-83	5	0	154	478	888	1075	988	770	806	688	379	113	6344
	83-84	3	0	72	375	843	1507	1344	955	848	661	170		6778
GUNNISON	AVE	111	188	393	719	1119	1590	1714	1422	1231	815	543	276	10122
	82-83	132	89	374	778	1146	1394	1379	1118	990	925	612	318	9255
	83-84	75	60	299	641	1128	1486	2112	1752	1435	986	432		10406
LAS ANIMAS	AVE	0	0	45	296	729	998	1101	820	698	348	102	9	5146
	82-83	0	0	43	313	758	978	1012	747	682	481	198	18	5230
	83-84	0	0	25	222	682	1357	1246	826	761	502	93		5719
LEAD-VILLE	AVE	272	337	522	817	1173	1435	1473	1318	1320	1038	726	439	10870
	82-83	0	323	540	974	1260	1426	1399	1259	1301	1220	896	544	11132
	83-84	308	316	488	832	1189	1529	1594	1389	1327	1171	702		10845
LIMON	AVE	8	6	144	448	834	1070	1156	960	936	570	299	100	6531
	82-83	18	5	184	539	936	1124	1077	898	935	792	464	166	7138
	83-84	7	0	109	442	874	1491	1334	1057	986	743	282		7325
LONGMONT	AVE	0	6	162	453	843	1082	1194	938	874	546	256	78	6432
	82-83	7	0	164	517	894	1087	1001	809	836	664	406	128	6513
	83-84	1	0	91	382	849	1500	1357	915	868	688	197		6848
MEEKER	AVE	28	56	261	564	927	1240	1345	1086	998	651	394	164	7714
	82-83	33	7	245	657	998	1225	1157	1010	901	806	498	199	7736
	83-84	12	2	145	512	897	1298	1571	1217	1006	781	311		7752
MONTROSE	AVE	0	10	135	437	837	1159	1218	941	818	522	254	69	6400
	82-83	4	2	111	556	846	1104	1094	828	759	620	347	89	6360
	83-84	0	0	73	390	833	1147	1332	1049	848	598	153		6423
PAGOSA SPRINGS	AVE	82	113	297	608	981	1305	1380	1123	1026	732	487	233	8367
	82-83	76	29	253	732	938	1338	1274	1013	943	819	565	286	8266
	83-84	51	10	190	566	977	1306	1524	1219	986	768			7597
PUEBLO	AVE	0	0	89	346	744	998	1091	834	756	421	163	23	5465
	82-83	0	0	63	427	794	1010	974	833	740	561	258	50	5710
	83-84	0	0	52	330	689	1375	1183	834	765	507	120		5855
RIFLE	AVE	6	24	177	499	876	1249	1321	1002	856	555	298	82	6945
	82-83	8	3	150	596	871	1129	1082	833	738	669	394	107	6580
	83-84	3	0	86	430	835	1249	1445	1094	824	639	198		6803
STEAMBOAT SPRINGS	AVE	113	169	390	704	1101	1476	1541	1277	1184	810	533	297	9595
	82-83	146	80	368	791	1183	1482	1446	1146	1024	939	618	333	9556
	83-84	120	61	334	663	1071	1463	1725	1400	1162	957	490		9446
STERLING	AVE	0	6	157	462	876	1163	1274	966	896	528	235	51	6614
	82-83	3	3	154	518	933	1098	1046	762	827	674	363	111	6492
	83-84	1	0	98	392	801	1637	1412	973	871	699	216		7100
TELLURIDE	AVE	163	223	396	676	1026	1293	1339	1151	1141	849	589	318	9164
	82-83	139	140	364	746	1022	1265	1195	1042	1036	956	620	355	8980
	83-84	108	130	288	597	1012	1261	1383	1154	1092	900	433		8358
TRINIDAD	AVE	0	0	86	359	738	973	1051	846	781	468	207	35	5544
	82-83	0	0	66	367	705	949	956	779	730	619	318	66	5555
	83-84	0	0	55	291	698	1368	1111	834	828	548	139		5872
WALDEN	AVE	198	285	501	822	1170	1457	1535	1313	1277	915	642	351	10466
	82-83	201	141	469	878	1242	1441	1396	1173	1122	1052	761	391	10267
	83-84	156	114	387	759	1120	1534	1643	1417	1240	1090	579		10039
WALSEN-BURG	AVE	0	8	102	370	720	924	989	820	781	501	240	49	5504
	82-83	0	1	95	400	714	927	880	719	763	627	314	92	5532
	83-84	0	0	87	310	683	1248	1001	801	799	552	117		5618

Table 2. Colorado Cooling Degree Day Data through May 1984.

COOLING DEGREE DATA

STATION		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
ALAMOSA	AVE	0	0	0	0	0	9	40	20	0	0	0	0	69
	1983	0	0	0	0	0	4	43	30	1	0	0	0	78
	1984	0	0	0	0	2								2
ASPEN	AVE	0	0	0	0	0	7	18	11	0	0	0	0	36
	1983	0	0	0	0	0	0	11	13	1	0	0	0	25
	1994	0	0	0	0	0								0
BOULDER	AVE	0	0	0	0	22	155	283	220	94	16	0	0	790
	1983	0	0	0	0	17	52	249	309	98	0	0	0	725
	1984	0	0	0	0	33								33
BUENA VISTA	AVE	0	0	0	0	0	13	37	26	0	0	0	0	76
	1983	0	0	0	0	0	1	39	22	2	0	0	0	64
	1984	0	0	0	0	0								0
BURLING-TON	AVE	0	0	0	0	26	179	325	253	93	11	0	0	887
	1983	0	0	0	0	15	109	360	420	135	1	0	0	1040
	1984	0	0	0	0	18								18
CANON CITY	AVE	0	0	0	0	33	183	329	266	93	15	0	0	919
	1983	0	0	0	0	10	88	336	328	135	0	0	0	897
	1984	0	0	0	0	56								56
COLORADO SPRINGS	AVE	0	0	0	0	8	99	200	149	45	0	0	0	501
	1983	0	0	0	0	1	48	236	219	71	0	0	0	575
	1984	0	0	0	0	17								17
CORTEZ	AVE	0	0	0	0	6	77	214	154	22	0	0	0	473
	1983	0	0	0	0	7	22	150	169	46	0	0	0	394
	1984	0	0	0	0	17								17
CRAIG	AVE	0	0	0	0	0	13	82	49	8	0	0	0	152
	1983	0	0	0	0	0	7	83	134	17	0	0	0	241
	1984	0	0	0	0	3								3
DELTA	AVE	0	0	0	0	21	115	282	208	52	0	0	0	678
	1983	0	0	0	0	14	74	263	328	121	0	0	0	800
	1984	0	0	0	0	11								11
DENVER	AVE	0	0	0	0	11	134	261	203	63	8	0	0	680
	1983	0	0	0	0	7	69	264	301	91	0	0	0	732
	1984	0	0	0	0	33								33
DILLON	AVE	0	0	0	0	0	0	0	0	0	0	0	0	0
	1983	0	0	0	0	0	0	0	0	0	0	0	0	0
	1984	0	0	0	0	0								0
DURANGO	AVE	0	0	0	0	0	20	111	71	7	0	0	0	209
	1983	0	0	0	0	1	9	159	152	24	0	0	0	345
	1984	0	0	0	0	6								6
EAGLE	AVE	0	0	0	0	0	9	71	39	0	0	0	0	119
	1983	0	0	0	0	0	1	65	112	9	0	0	0	187
	1984	0	0	0	0	0								0
EVER-GREEN	AVE													
	1983	0	0	0	0	0	0	28	25	8	0	0	0	61
	1984	0	0	0	0	0								0
FORT COLLINS	AVE	0	0	0	0	5	100	204	132	30	0	0	0	471
	1983	0	0	0	0	8	56	220	281	51	0	0	0	616
	1984	0	0	0	0	15								15
FORT MORGAN	AVE	0	0	0	0	16	155	304	223	62	0	0	0	760
	1983	0	0	0	0	17	97	341	424	144	1	0	0	1024
	1984	0	0	0	0	59								59
GRAND JUNCTION	AVE	0	0	0	0	58	238	431	338	128	12	0	0	1205
	1983	0	0	0	0	49	171	422	483	226	3	0	0	1354
	1984	0	0	0	0	130								130

COOLING DEGREE DATA

STATION		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
GRAND LAKE	AVE	0	0	0	0	0	0	0	0	0	0	0	0	0
	1983	0	0	0	0	0	0	0	0	156	0	0	0	156
	1984	0	0	0	0	0								0
GREELEY	AVE	0	0	0	0	15	130	267	185	50	0	0	0	647
	1983	0	0	0	0	5	83	257	319	65	0	0	0	729
	1984	0	0	0	0	34								34
GUNNISON	AVE	0	0	0	0	0	0	9	9	0	0	0	0	18
	1983	0	0	0	0	0	0	16	16	0	0	0	0	32
	1984	0	0	0	0	0								0
LAS ANIMAS	AVE	0	0	0	6	53	270	425	344	120	8	0	0	1226
	1983	0	0	0	6	34	201	516	512	256	11	0	0	1536
	1984	0	0	0	0	95								95
LEAD-VILLE	AVE	0	0	0	0	0	0	0	0	0	0	0	0	0
	1983	0	0	0	0	0	0	0	0	0	0	0	0	0
	1984	0	0	0	0	0								0
LIMON	AVE	0	0	0	0	8	97	206	158	39	8	0	0	516
	1983	0	0	0	0	1	36	215	239	76	0	0	0	567
	1984	0	0	0	0	5								5
LONGMONT	AVE	0	0	0	0	8	117	227	158	45	0	0	0	555
	1983	0	0	0	0	11	82	263	315	89	0	0	0	760
	1984	0	0	0	0	31								31
MEEKER	AVE	0	0	0	0	0	14	87	49	12	0	0	0	162
	1983	0	0	0	0	0	2	79	127	21	0	0	0	229
	1984	0	0	0	0	0								0
MONTROSE	AVE	0	0	0	0	12	120	242	162	45	0	0	0	581
	1983	0	0	0	0	11	90	233	240	88	0	0	0	652
	1984	0	0	0	0	58								58
PAGOSA SPRINGS	AVE	0	0	0	0	0	8	51	27	0	0	0	0	86
	1983	0	0	0	0	0	2	35	42	11	0	0	0	90
	1984	0	0	0	0									0
PUEBLO	AVE	0	0	0	0	39	212	369	295	119	8	0	0	1042
	1983	0	0	0	0	16	120	391	391	149	0	0	0	1067
	1984	0	0	0	0	76								76
RIFLE	AVE	0	0	0	0	0	46	167	117	15	0	0	0	345
	1983	0	0	0	0	0	29	178	249	57	0	0	0	513
	1984	0	0	0	0	8								8
STEAMBOAT SPRINGS	AVE	0	0	0	0	0	0	11	7	0	0	0	0	18
	1983	0	0	0	0	0	0	3	21	2	0	0	0	26
	1984	0	0	0	0	0								0
STERLING	AVE	0	0	0	0	15	147	293	214	52	0	0	0	721
	1983	0	0	0	0	12	84	301	398	101	2	0	0	898
	1984	0	0	0	0	22								22
TELLURIDE	AVE	0	0	0	0	0	0	0	0	0	0	0	0	0
	1983	0	0	0	0	0	0	2	1	0	0	0	0	3
	1984	0	0	0	0	0								0
TRINIDAD	AVE	0	0	0	0	18	155	279	216	68	5	0	0	741
	1983	0	0	0	0	1	100	327	319	167	0	0	0	914
	1984	0	0	0	0	63								63
WALDEN	AVE	0	0	0	0	0	0	0	0	0	0	0	0	0
	1983	0	0	0	0	0	0	1	2	0	0	0	0	3
	1984	0	0	0	0	0								0
WALSEN-BURG	AVE	0	0	0	0	8	109	219	157	45	0	0	0	538
	1983	0	0	0	0	2	67	266	250	108	2	0	0	695
	1984	0	0	0	0	47								47

COLORADO CLIMATE -- JUNE 1984

Colorado Climate Center
Department of Atmospheric Science
Fort Collins, Colorado 80523

June precipitation ranged from much below average over the Eastern Plains of Colorado to much above average over the mountains and western valleys. Temperatures were a bit cooler than average in most areas. The most newsworthy items were record snows in the Central Mountains and a devastating hailstorm in portions of the Denver metropolitan area.

Significant Highlights -- June

Date	Event
1-2	Cool, unstable air covered the state. Some moderate rainfall amounts on the 1st such as 1.00" at Brandon, 0.87" at Steamboat Springs and 0.68" at Fort Collins. Chilly morning temperatures occurred on the 2nd. Leadville cooled to 24° and Rio Grande Reservoir hit 21°F that morning.
3-4	Another Pacific cold front crossed Colorado setting off scattered, mostly light shower and thundershower activity.
5-8	Winter-like storm system pushed into the Colorado mountains and the western states with abnormally cold temperatures and widespread heavy precipitation. While eastern Colorado only had a few light showers, 2-3" rainfall totals were common over most of western Colorado with high elevation snows. Eagle's 3" snowfall on the 7th was their greatest ever in June. Other new snowfall records included 15.5" at Aspen, 16" at Breckenridge and 23.9" at Climax including 18" in 24 hours ending on the 7th. The greatest 24-hour precipitation total was 2.92" near Redstone. Despite this widespread heavy precipitation, serious flooding was averted since the cold temperatures slowed high elevation snowmelt.
9-10	Precipitation ended but cold temperatures remained as a low pressure trough aloft lingered over the western states. The coldest temperatures of the month occurred over most of Colorado. Boulder cooled to 39° on the 10th. Dillon was also nippy that morning with a 25°. Bonham Reservoir on the Grand Mesa took honors for the coldest June temperature in the state with 16° on the 9th followed closely by 17° at Rio Grande Reservoir.

11-15 Dry and warmer in western Colorado, but high pressure east and north of the state pushed moist air into eastern Colorado setting off afternoon storms. Several locally heavy storms developed, but the real attention-getter was the slow moving hailstorm which formed just west of Denver on the 13th and dropped large quantities of rain and hail. The greatest official rainfall total was 2.50" at Lakewood but there were reports of up to 4.50" of rain with hail several inches deep. Estimates of property damage from the storm in the metropolitan area were close to $300 million. It took several days for all of the hail to melt.

16-17 An upper air disturbance crossed the state from the southwest. Scattered showers and thunderstorms fell over most areas. Rainfall totals were mostly light but the Hermit weather station near Creede received 0.95".

18-21 Seasonal summer weather. Just a few widely scattered afternoon thunderstorms. Trinidad got in the way of one of those storms and got soaked by 1.12" of rain on the 18th.

22-29 Typical late June weather -- lots of sunshine and warm temperatures with little day to day change. A few isolated thundershowers each afternoon didn't amount to much. Daytime temperatures mid 80s to 90s at the lower elevations with mostly 70s in the mountains -- hot, but not unusual for late June. Holly and Las Animas shared honors for the state's hot spot with 103°. Holly hit it twice, the 21st and the 25th. The 29th was the warmest day statewide. Denver reached 94°.

30 Cooler temperatures and a few more showers as a Pacific cold front crossed the state.

Precipitation Summary

Precipitation totals and percents of average are shown in Figures 1 and 2. For the second year in a row, June was very wet from the Continental Divide westward. Most reporting stations had at least double their average precipitation, and 6 stations had more than 4 times their average. Rifle's 3.71" total broke their June record which had just been set last year. Fruita's 2.65" (552% of average) total was also the wettest on record since 1890. Wolf Creek Pass was the wettest station in Colorado with 6.25", also a new record for the month.

It was a different story east of the Divide. Near average precipitation fell in the San Luis Valley and along portions of the Front Range. Farther east, rainfall was below average with the Arkansas Valley the driest. Holly's 0.25" total was just 8% of average. Ordway

only measured 0.14" for the month. Typical summer variability was again observed. In the Denver area totals ranged from more than double the average in Wheatridge to only one third of average in Littleton.

Water Year Precipitation to Date

With three-fourths of the 1984 water year now history, precipitation totals continue well above average over western Colorado (Figure 3). Two consecutive dry months on the Eastern Plains have dramatically lowered the percentages there and totals are now just about normal. The Front Range is also near normal.

Temperature Summary

June began cool and ended hot which resulted in monthly averages which were just a little below normal (Figure 4). The coldest temperatures were in northwest Colorado. Aspen, Meeker and Rifle were all 3 or more degrees below average. The only areas above average were in the lower Arkansas Valley and in portions of the San Juan Mountains.

Degree Days

Heating and cooling degree day statistics are shown in Tables 1 and 2 (65° base). This summer we are also displaying growing degree days for agricultural applications (Figure 5). For the precise definition of growing degree days please refer to the May issue of Colorado Climate.

Figure 1. June 1984 precipitation amounts (inches).

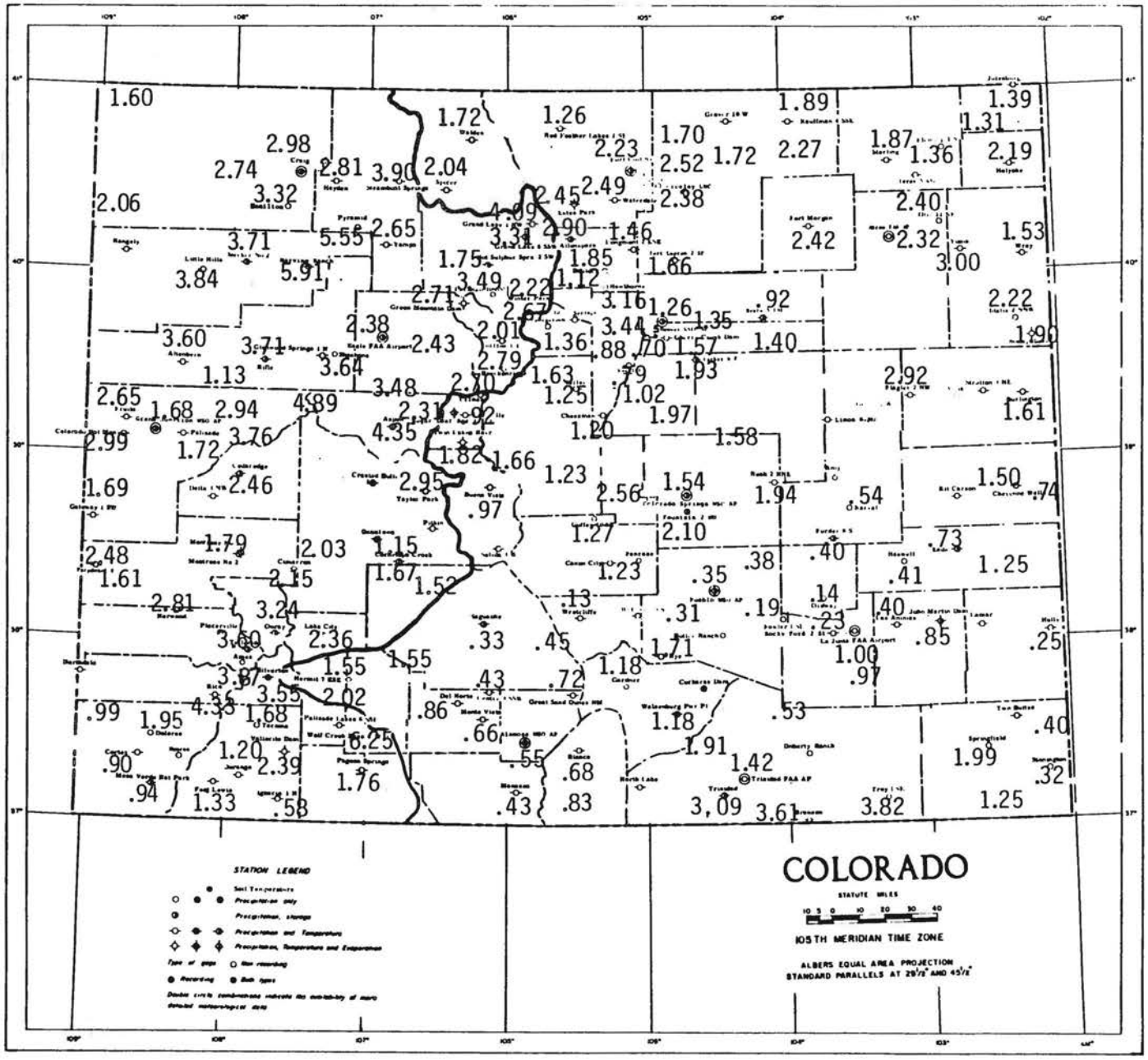

Figure 2. Precipitation for June 1984 as a percent of the 1961-1980 average.

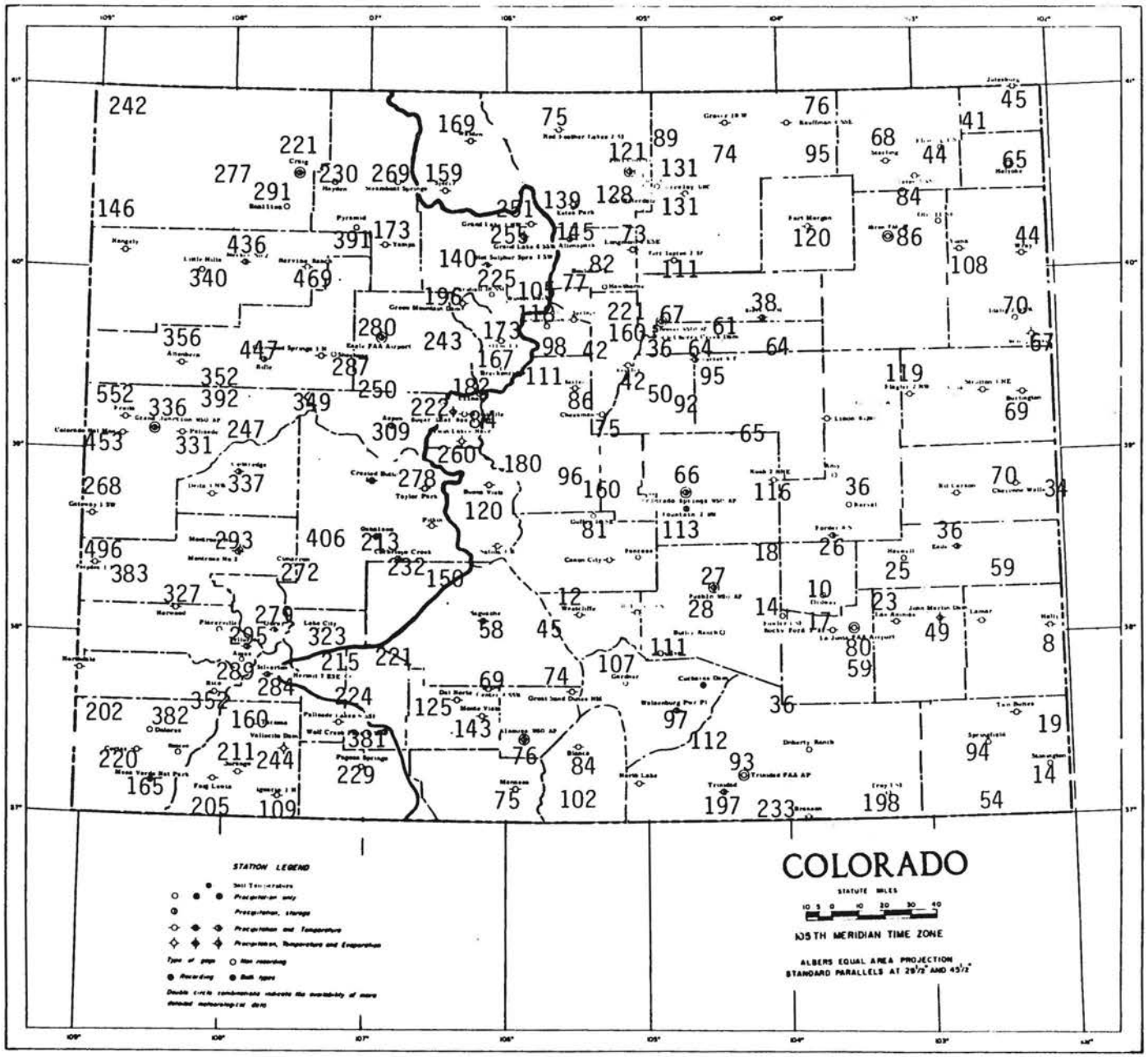

Figure 3. Precipitation for October 1983 through June 1984 as a percent of the 1961-1980 average.

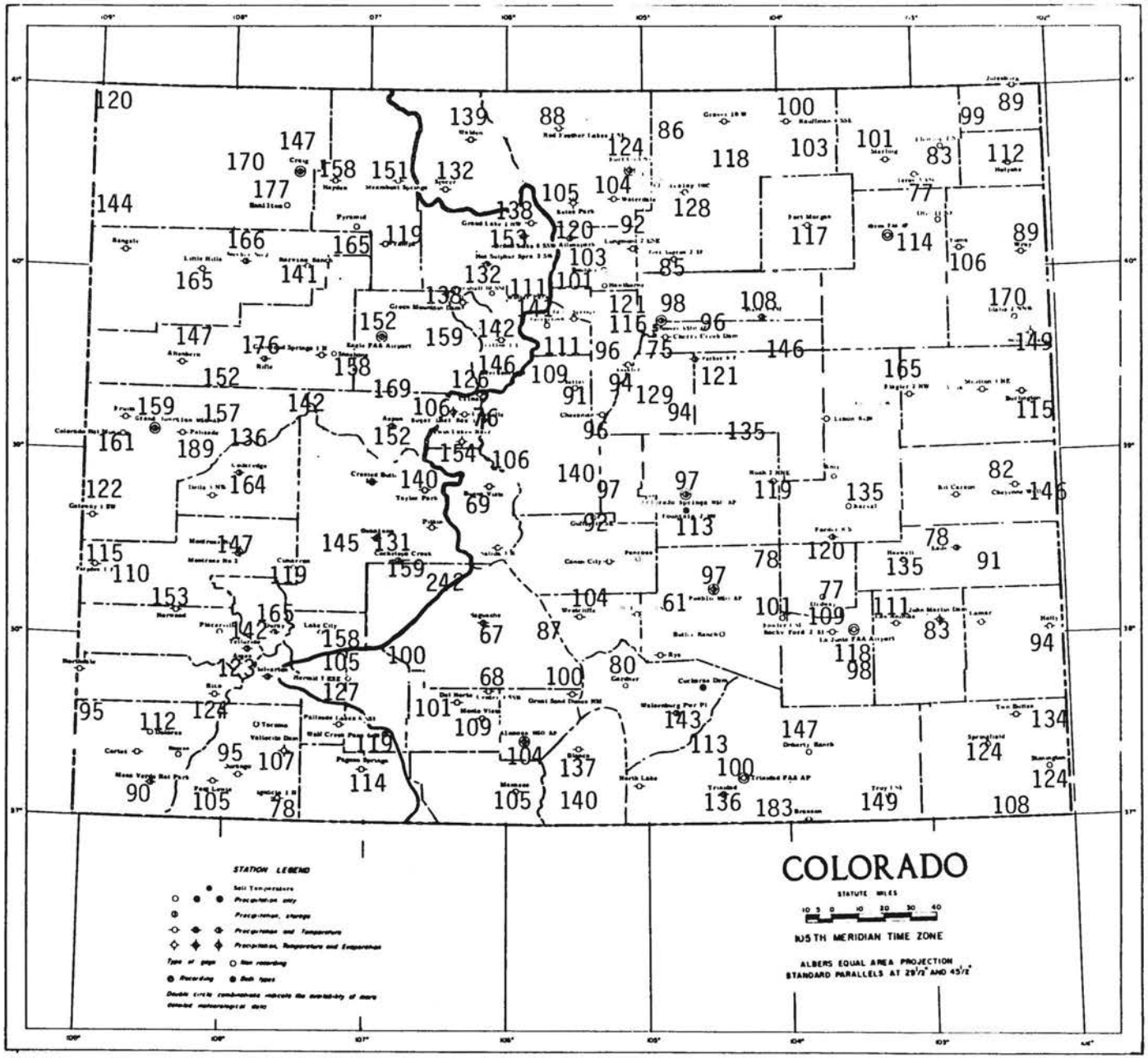

Figure 4. Temperatures for June 1984 in degrees Fahrenheit (in parentheses) and departures from the 1961-1980 average.

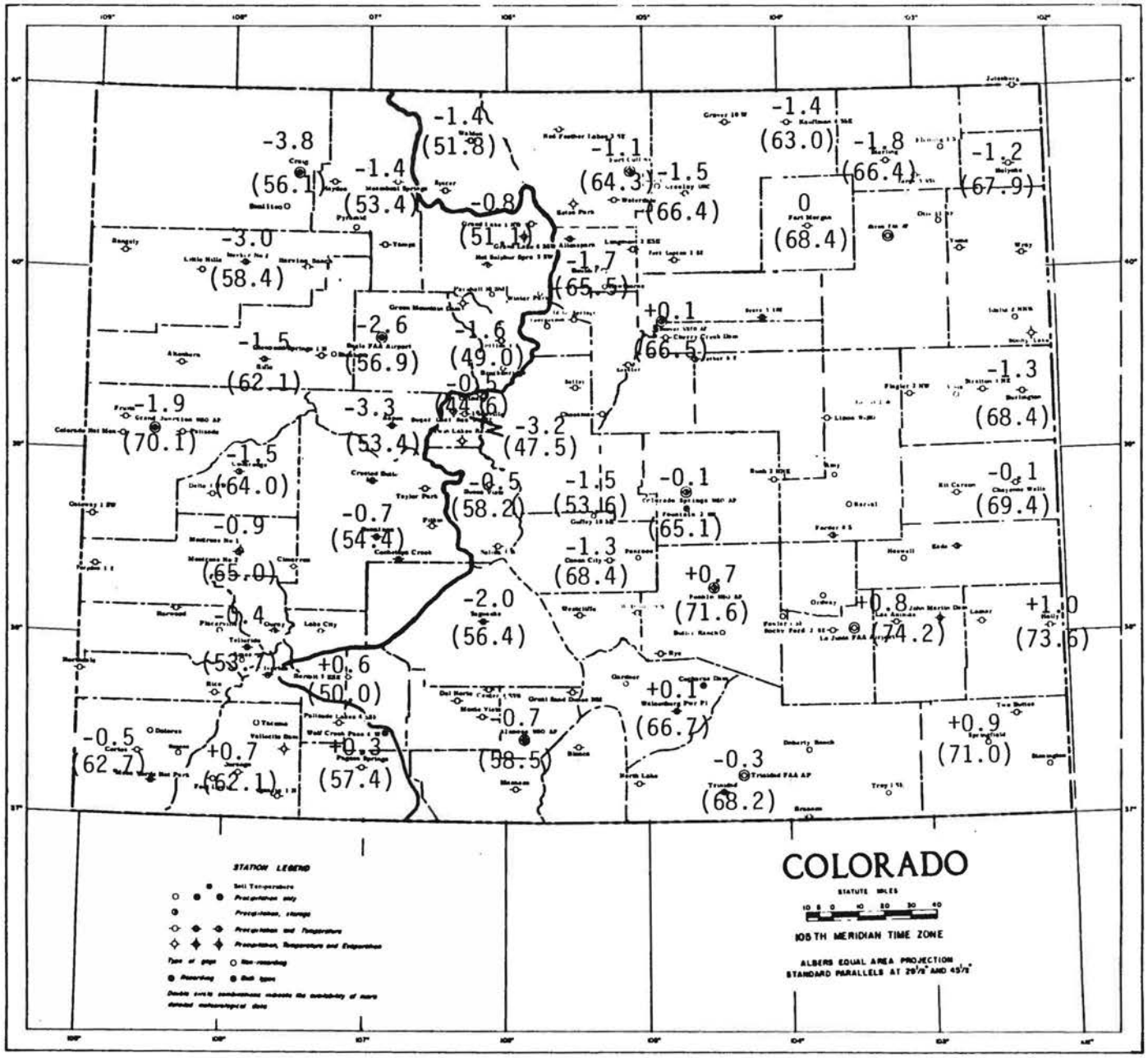

Figure 5. June 1984 growing degree days and total since May 1 (in parentheses).

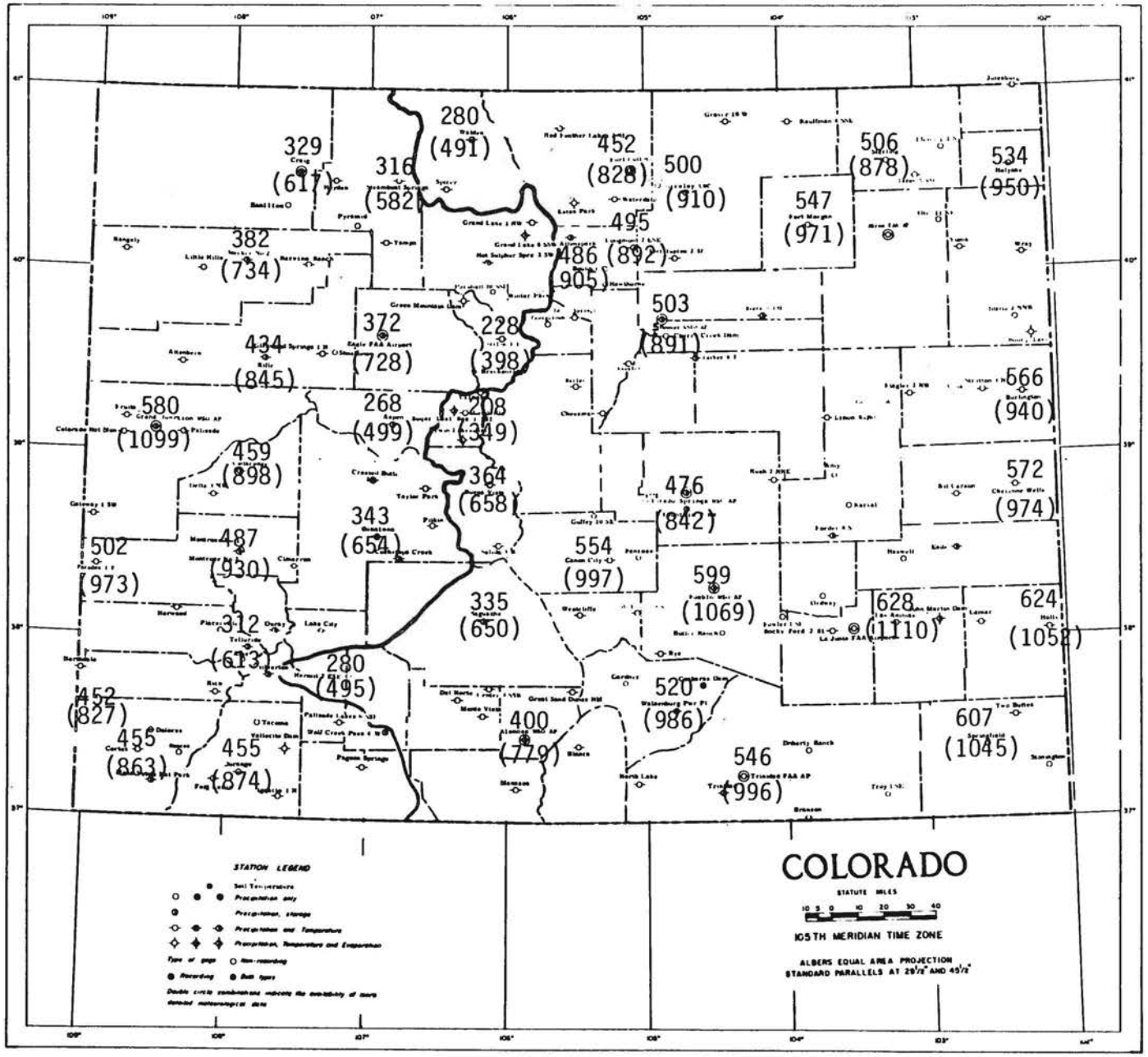

Table 1. Colorado Heating Degree Day Data through June 1984.

HEATING DEGREE DATA

STATION		JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	ANN
ALAMOSA	AVE	40	100	303	657	1074	1457	1519	1182	1035	732	453	165	8717
	82-83	59	47	274	714	1016	1361	1380	1080	945	856	556	249	8537
	83-84	28	35	213	674	1112	1581	1982	1566	1166	799	300	188	9644
ASPEN	AVE	95	150	348	651	1029	1339	1376	1162	1116	798	524	262	8850
	82-83	148	119	362	808	1105	1326	1301	1095	1066	959	691	350	9330
	83-84	97	86	269	622	1021	1392	1470	1200	1108	932	477	345	9019
BOULDER	AVE	0	6	130	357	714	908	1004	804	775	483	220	59	5460
	82-83	4	0	154	442	769	913	963	819	811	639	380	120	6014
	83-84	4	0	84	350	753	1367	1087	830	792	639	168	58	6132
BUENA VISTA	AVE	47	116	285	577	936	1184	1218	1025	983	720	459	184	7734
	82-83	47	70	284	745	798	1160	1105	995	990	897	547	266	7904
	83-84	45	49	234	595	970	1333	1331	1020	982	808	370	203	7940
BURLING-TON	AVE	6	5	108	364	762	1017	1110	871	803	459	200	38	5743
	82-83	0	5	99	405	818	999	1006	784	832	637	339	81	6005
	83-84	0	0	87	359	758	1500	1172	884	883	700	200	34	6577
CANON CITY	AVE	0	9	81	301	639	831	911	734	707	411	179	33	4836
	82-83	3	6	109	391	745	890	829	711	726	579	302	85	5376
	83-84	0	0	71	314	649	1278	993	760	752	570	134	27	5548
COLORADO SPRINGS	AVE	8	25	162	440	819	1042	1122	910	880	564	296	78	6346
	82-83	8	11	198	532	880	1084	1001	851	904	742	444	159	6814
	83-84	2	0	101	417	811	1438	1197	911	912	700	220	58	6767
CORTEZ	AVE	0	11	115	434	813	1132	1181	921	828	555	292	68	6350
	82-83	17	5	132	606	856	1148	1168	939	878	723	438	131	7041
	83-84	5	0	98	438	854	1154	1271	1018		677	239	119	5873
CRAIG	AVE	32	58	275	608	996	1342	1479	1193	1094	687	419	193	8376
	82-83	37	5	271	752	1116	1361	1305	1130	989	847	561	228	8602
	83-84	41	3	212	579	1005	1471	1730	1420	1194	884	383	267	9189
DELTA	AVE	0	0	94	394	813	1135	1197	890	753	429	167	31	5903
	82-83	2	4	81	496	777	1043	1040	753	686	513	272	66	5733
	83-84	0	0	60	340	727	1061	1366	1006	736	505	135		5936
DENVER	AVE	0	0	135	414	789	1004	1101	879	837	528	253	74	6014
	82-83	3	0	151	487	875	1050	1017	789	885	712	419	129	6517
	83-84	3	0	87	372	833	1466	1162	889	854	673	183	51	6573
DILLON	AVE	273	332	513	806	1167	1435	1516	1305	1296	972	704	435	10754
	82-83	318	253	511	959	1235	1450	1418	1265	1227	1158	842	496	11132
	83-84	263	224	438	789	1135	1492	1653	1419	1333	1124	675	472	11017
DURANGO	AVE	9	34	193	493	837	1153	1218	958	862	600	366	125	6848
	82-83	24	6	175	614	874	1197	1130	909	850	735	405	147	7066
	83-84	3	0	124	464	899	1161	1289	1009	835	665	209	113	6771
EAGLE	AVE	33	80	288	626	1026	1407	1448	1148	1014	705	431	171	8377
	82-83	54	21	257	720	1059	1350	1273	974	880	846	529	219	8182
	83-84	30	3	203	579	962	1337	1681	1299	1015	798	338	238	8483
EVER-GREEN	AVE	59	113	327	621	916	1135	1199	1011	1009	730	489	218	7827
	82-83	110	41	339	733	1032	1184	940	979	1056	961	694	324	8393
	83-84	72	15	228	605	971	1449	1239	1040	1051	864	375	231	8140
FORT COLLINS	AVE	5	11	171	468	846	1073	1181	930	877	558	281	82	6483
	82-83	4	0	178	509	925	1082	968	787	830	715	389	127	6514
	83-84	2	0	115	415	843	1432	1225	887	829	661	196	81	6686
FORT MORGAN	AVE	0	6	140	438	867	1156	1283	969	874	516	224	47	6520
	82-83	3	3	123	492	895	1086	1050	804	798	663	346	108	6371
	83-84	0	0	77	368	782	1614	1493	998	844	650	158	38	7022
GRAND JUNCTION	AVE	0	0	65	325	762	1138	1225	882	716	403	148	19	5683
	82-83	2	0	61	397	704	983	946	668	586	482	239	22	5090
	83-84	0	0	27	208	678	1066	1366	958	630	474	89	44	5540

HEATING DEGREE DATA

STATION		JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	ANN
GRAND LAKE	AVE	214	264	468	775	1128	1473	1593	1369	1318	951	654	384	10591
	82-83	254	180	452	878	1236	1505	1489	1280	1219	1157	803	443	10896
	83-84	233	156	400	703	1052	1436	1743	1486	1301	1120	630	411	10671
GREELEY	AVE	0	0	149	450	861	1128	1240	946	856	522	238	52	6442
	82-83	5	0	154	478	888	1075	988	770	806	688	379	113	6344
	83-84	3	0	72	375	843	1507	1344	955	848	661	170	49	6827
GUNNISON	AVE	111	188	393	719	1119	1590	1714	1422	1231	816	543	276	10122
	82-83	132	89	374	778	1146	1394	1379	1118	990	925	612	318	9255
	83-84	75	60	299	641	1128	1486	2112	1752	1435	986	432	307	10713
LAS ANIMAS	AVE	0	0	45	296	729	998	1101	820	698	348	102	9	5146
	82-83	0	0	43	313	758	978	1012	747	682	481	198	18	5230
	83-84	0	0	25	222	682	1357	1246	826	761	502	98	3	5722
LEAD-VILLE	AVE	272	337	522	817	1173	1435	1473	1318	1320	1038	726	439	10870
	82-83	0	323	540	974	1260	1426	1399	1259	1301	1220	886	544	11132
	83-84	308	316	488	832	1189	1529	1594	1389	1327	1171	702	515	11360
LIMON	AVE	8	6	144	448	834	1070	1156	960	936	570	299	100	6531
	82-83	18	5	184	539	936	1124	1077	898	935	792	464	166	7138
	83-84	7	0	109	442	874	1491	1334	1057	986	743	282		7325
LONGMONT	AVE	0	6	162	453	843	1082	1194	938	874	546	256	78	6432
	82-83	7	0	164	517	894	1087	1001	809	836	664	406	128	6513
	83-84	1	0	91	382	849	1500	1357	915	868	688	197	54	6902
MEEKER	AVE	28	56	261	564	927	1240	1345	1086	998	651	394	164	7714
	82-83	33	7	245	657	998	1225	1157	1010	901	806	498	199	7736
	83-84	12	2	145	512	897	1298	1571	1217	1006	781	311	204	7956
MONTROSE	AVE	0	10	135	437	837	1159	1218	941	818	522	254	69	6400
	82-83	4	2	111	556	846	1104	1094	828	759	620	347	89	6360
	83-84	0	0	73	390	833	1147	1332	1049	848	598	153	86	6509
PAGOSA SPRINGS	AVE	82	113	297	608	981	1305	1380	1123	1026	732	487	233	8367
	82-83	76	29	253	732	938	1338	1274	1013	943	819	565	286	8266
	83-84	51	10	190	566	977	1306	1524	1219	986	768	366	220	8183
PUEBLO	AVE	0	0	89	346	744	998	1091	834	756	421	163	23	5465
	82-83	0	0	63	427	794	1010	974	833	740	561	258	50	5710
	83-84	0	0	52	330	689	1375	1183	834	765	507	120	2	5857
RIFLE	AVE	6	24	177	499	876	1249	1321	1002	856	555	298	82	6945
	82-83	8	3	150	596	871	1129	1082	833	738	669	394	107	6580
	83-84	3	0	86	430	835	1249	1445	1094	824	639	198	110	6913
STEAMBOAT SPRINGS	AVE	113	169	390	704	1101	1476	1541	1277	1184	810	533	297	9595
	82-83	146	80	368	791	1183	1482	1446	1146	1024	939	618	333	9556
	83-84	120	61	334	663	1071	1463	1725	1400	1162	957	490	339	9785
STERLING	AVE	0	6	157	462	876	1163	1274	966	896	528	235	51	6614
	82-83	3	3	154	518	933	1098	1046	762	827	674	363	111	6492
	83-84	1	0	98	392	801	1637	1412	973	871	699	216	62	7162
TELLURIDE	AVE	163	223	396	676	1026	1293	1339	1151	1141	849	589	318	9164
	82-83	139	140	364	746	1022	1265	1195	1042	1036	956	620	355	8880
	83-84	108	130	288	597	1012	1261	1383	1154	1092	900	433	331	8689
TRINIDAD	AVE	0	0	86	359	738	973	1051	846	781	468	207	35	5544
	82-83	0	0	66	367	705	949	956	779	730	619	318	66	5555
	83-84	0	0	55	291	698	1368	1111	834	828	548	139	20	5892
WALDEN	AVE	198	285	501	822	1170	1457	1535	1313	1277	915	642	351	10466
	82-83	201	141	469	878	1242	1441	1396	1173	1122	1052	761	391	10267
	83-84	156	114	387	759	1120	1534	1643	1417	1240	1090	579	386	10425
WALSEN-BURG	AVE	0	8	102	370	720	924	989	820	781	501	240	49	5504
	82-83	0	1	95	400	714	927	880	719	763	627	314	92	5532
	83-84	0	0	87	310	683	1248	1001	801	789	552	147	32	5650

Table 2. Colorado Cooling Degree Day Data through June 1984.

COOLING DEGREE DATA

STATION		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
ALAMOSA	AVE	0	0	0	0	0	9	40	20	0	0	0	0	69
	1983	0	0	0	0	0	4	43	30	1	0	0	0	78
	1984	0	0	0	0	2	1							3
ASPEN	AVE	0	0	0	0	0	7	18	11	0	0	0	0	36
	1983	0	0	0	0	0	0	11	13	1	0	0	0	25
	1984	0	0	0	0	0	1							1
BOULDER	AVE	0	0	0	0	22	155	283	220	94	16	0	0	790
	1983	0	0	0	0	17	52	249	309	98	0	0	0	725
	1984	0	0	0	0	33	82							115
BUENA VISTA	AVE	0	0	0	0	0	13	37	26	0	0	0	0	76
	1983	0	0	0	0	0	1	39	22	2	0	0	0	64
	1984	0	0	0	0	0	6							6
BURLING-TON	AVE	0	0	0	0	26	179	325	253	93	11	0	0	887
	1983	0	0	0	0	15	109	360	420	135	1	0	0	1040
	1984	0	0	0	0	18	145							163
CANON CITY	AVE	0	0	0	0	33	183	329	266	93	15	0	0	919
	1983	0	0	0	0	10	88	336	328	135	0	0	0	897
	1984	0	0	0	0	56	134							190
COLORADO SPRINGS	AVE	0	0	0	0	8	99	200	149	45	0	0	0	501
	1983	0	0	0	0	1	48	236	219	71	0	0	0	575
	1984	0	0	0	0	17	68							85
CORTEZ	AVE	0	0	0	0	6	77	214	154	22	0	0	0	473
	1983	0	0	0	0	7	22	150	169	46	0	0	0	394
	1984	0	0	0	0	17	57							74
CRAIG	AVE	0	0	0	0	0	13	82	49	8	0	0	0	152
	1983	0	0	0	0	0	7	83	134	17	0	0	0	241
	1984	0	0	0	0	3	6							9
DELTA	AVE	0	0	0	0	21	115	282	208	52	0	0	0	678
	1983	0	0	0	0	14	74	263	328	121	0	0	0	800
	1984	0	0	0	0	11								11
DENVER	AVE	0	0	0	0	11	134	261	203	63	8	0	0	680
	1983	0	0	0	0	7	69	264	301	91	0	0	0	732
	1984	0	0	0	0	33	104							137
DILLON	AVE	0	0	0	0	0	0	0	0	0	0	0	0	0
	1983	0	0	0	0	0	0	0	0	0	0	0	0	0
	1984	0	0	0	0	0	0							0
DURANGO	AVE	0	0	0	0	0	20	111	71	7	0	0	0	209
	1983	0	0	0	0	1	9	159	152	24	0	0	0	345
	1984	0	0	0	0	6	33							39
EAGLE	AVE	0	0	0	0	0	9	71	39	0	0	0	0	119
	1983	0	0	0	0	0	1	65	112	9	0	0	0	187
	1984	0	0	0	0	0	3							3
EVER-GREEN	AVE													
	1983	0	0	0	0	0	0	28	25	8	0	0	0	61
	1984	0	0	0	0	0	1							1
FORT COLLINS	AVE	0	0	0	0	5	100	204	132	30	0	0	0	471
	1983	0	0	0	0	8	56	220	281	51	0	0	0	616
	1984	0	0	0	0	15	65							80
FORT MORGAN	AVE	0	0	0	0	16	155	304	223	62	0	0	0	760
	1983	0	0	0	0	17	97	341	424	144	1	0	0	1024
	1984	0	0	0	0	59	149							208
GRAND JUNCTION	AVE	0	0	0	0	58	238	431	338	128	12	0	0	1205
	1983	0	0	0	0	49	171	422	483	226	3	0	0	1354
	1984	0	0	0	0	130	200							330

COOLING DEGREE DATA

STATION		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
GRAND LAKE	AVE	0	0	0	0	0	0	0	0	0	0	0	0	0
	1983	0	0	0	0	0	0	0	0	156	0	0	0	156
	1984	0	0	0	0	0	0							0
GREELEY	AVE	0	0	0	0	15	130	267	185	50	0	0	0	647
	1983	0	0	0	0	5	83	257	319	65	0	0	0	729
	1984	0	0	0	0	34	97							131
GUNNISON	AVE	0	0	0	0	0	0	9	9	0	0	0	0	18
	1983	0	0	0	0	0	0	16	16	0	0	0	0	32
	1984	0	0	0	0	0	0							0
LAS ANIMAS	AVE	0	0	0	6	53	270	425	344	120	8	0	0	1226
	1983	0	0	0	6	34	201	516	512	256	11	0	0	1536
	1984	0	0	0	0	95	289							384
LEAD-VILLE	AVE	0	0	0	0	0	0	0	0	0	0	0	0	0
	1983	0	0	0	0	0	0	0	0	0	0	0	0	0
	1984	0	0	0	0	0	0							0
LIMON	AVE	0	0	0	0	8	97	206	158	39	8	0	0	516
	1983	0	0	0	0	1	36	215	239	76	0	0	0	567
	1984	0	0	0	0	5								5
LONGMONT	AVE	0	0	0	0	8	117	227	158	45	0	0	0	555
	1983	0	0	0	0	11	82	263	315	89	0	0	0	760
	1984	0	0	0	0	31	99							130
MEEKER	AVE	0	0	0	0	0	14	87	49	12	0	0	0	162
	1983	0	0	0	0	0	2	79	127	21	0	0	0	229
	1984	0	0	0	0	0	14							14
MONTROSE	AVE	0	0	0	0	12	120	242	162	45	0	0	0	581
	1983	0	0	0	0	11	80	233	240	88	0	0	0	652
	1984	0	0	0	0	58	91							149
PAGOSA SPRINGS	AVE	0	0	0	0	0	8	51	27	0	0	0	0	86
	1983	0	0	0	0	0	2	35	42	11	0	0	0	90
	1984	0	0	0	0	0	1							1
PUEBLO	AVE	0	0	0	0	39	212	369	295	119	8	0	0	1042
	1983	0	0	0	0	16	120	391	391	149	0	0	0	1067
	1984	0	0	0	0	76	208							284
RIFLE	AVE	0	0	0	0	0	46	167	117	15	0	0	0	345
	1983	0	0	0	0	0	29	178	249	57	0	0	0	513
	1984	0	0	0	0	8	30							38
STEAMBOAT SPRINGS	AVE	0	0	0	0	0	0	11	7	0	0	0	0	18
	1983	0	0	0	0	0	0	3	21	2	0	0	0	26
	1984	0	0	0	0	0	0							0
STERLING	AVE	0	0	0	0	15	147	293	214	52	0	0	0	721
	1983	0	0	0	0	12	84	301	398	101	2	0	0	898
	1984	0	0	0	0	22	110							132
TELLURIDE	AVE	0	0	0	0	0	0	0	0	0	0	0	0	0
	1983	0	0	0	0	0	0	2	1	0	0	0	0	3
	1984	0	0	0	0	0	0							0
TRINIDAD	AVE	0	0	0	0	18	155	279	216	68	5	0	0	741
	1983	0	0	0	0	1	100	327	319	167	0	0	0	914
	1984	0	0	0	0	63	125							188
WALDEN	AVE	0	0	0	0	0	0	0	0	0	0	0	0	0
	1983	0	0	0	0	0	0	1	2	0	0	0	0	3
	1984	0	0	0	0	0	0							0
WALSEN-BURG	AVE	0	0	0	0	8	109	219	157	45	0	0	0	538
	1983	0	0	0	0	2	67	266	250	108	2	0	0	695
	1984	0	0	0	0	47	91							138

COLORADO CLIMATE -- JULY 1984

Colorado Climate Center
Department of Atmospheric Science
Fort Collins, Colorado 80523

The "southwest monsoon" was evident during the last half of July as moist, tropical air moved northward into Colorado setting off daily slow-moving thunderstorms. Monthly precipitation was above average in and near the mountains. Temperatures in July were very close to average.

Significant Highlights -- July

Date	Event
1	Thunderstorms over the northeast plains from the previous night lingered until sunrise. Heavy rainfall amounts were measured such as 1.65" at Holyoke and 2.54" at the Fleming station.
2-7	Sunny, dry and hot over most of the state. Widely scattered thunderstorms occurred east of the mountains. The Tacony weather station northeast of Pueblo received 2.02" in a brief downpour on the 2nd. Daytime temperatures were mostly in the upper 80s and 90s at lower elevations with a few 100s in the southeast. Many locations had their warmest temperatures so far this year on the 6th and 7th such as 90° at Craig, 98° at Boulder and Greeley, and 104° at Las Animas.
8-12	Hot on the 8-9 but cooler 10-12. Holly's 106° reading on the 8th was the warmest in the state for the month. Moist air moving up from the southwest set off widespread thunderstorms in and near the mountains, especially on the 9-10. Eagle's 1.16" rain on the 9th was one of their heaviest July rainfalls on record. Much drier on the 11-12 with cool nighttime temperatures. Sterling enjoyed lows of 51° both mornings while Taylor Park Reservoir again claimed the coldest temperature of the month with a 27° reading on the 12th.
13-16	Scattered but locally heavy thunderstorms in the western half of the state 13-14. Paonia and Avon received 0.87" and 0.91", respectively, overnight on the 13th. Drier in the west 15-16, but heavy storms developed in the Arkansas Valley. Nine official stations in the southeast got more than 1.00" of rain. Holly's 2.28" total was the greatest

report although unofficial reports indicated much heavier amounts with local flooding.

17-21 Typical Colorado summer weather -- warm temperatures with widely scattered afternoon and evening thunderstorms. Several stations reported their highest temperatures of the summer on the 21st: 86° at Walden, 79° at Dillon, and 97° at Denver.

22-31 Tropical moisture drifted into Colorado from the south. Humid and stormy period with heavy slow-moving thunderstorms each day, especially near the mountains, producing some local flooding. Heaviest rainfall amounts included 1.23" at Kremmling on the 22nd, 1.34" at Allenspark on the 25th, 2.05" at Silver Lake on the 26th, 1.90" north of Ordway on the 27th, 1.60" at Colorado Springs and 2.18" at Antero Reservoir on the 28th, 1.83" at Limon on the 29th, and 2.22" near Canon City on the 30th.

Precipitation Summary

Precipitation totals for July and percents of average are shown in Figures 1 and 2. The mountains, western valleys, and the eastern foothills from near Pueblo northward to Wyoming were wetter than average. The Avon-Eagle area received more than 3 times the average July precipitation making this their wettest July in nearly 50 years. The wettest reporting station in Colorado was Silver Lake west of Boulder which received 6.43 inches. On 18 separate days more than 1.00" of rain fell somewhere within Colorado. Not all of the state was wet, however. Scattered small areas on the Western Slope near Meeker, Norwood, and Mesa Verde were a little drier than average. Most of the San Luis Valley was also quite dry. Precipitation on the Eastern Plains was very spotty. Totals ranged from just 0.31" at Troy and 0.58" at Windsor to nearly 4.00" at Holly and 6.13" at Fort Carson. On the average, the Eastern Plains received about 75% of the average July precipitation.

Water Year Precipitation to Date

Precipitation as a percent of average for the first 10 months of the 1984 water year is shown in Figure 3. Except for a few scattered areas on the Eastern Plains, in the San Luis Valley, and in the extreme southwest, the rest of Colorado has been wetter than average. Nearly half of the reporting stations west of the Continental Divide have

received at least 150% of their average precipitation. As a result, surface water supplies remain very good.

Temperature Summary

July temperatures (Figure 4) were close to normal across the entire state. The Western Slope was generally about one degree above average while the extreme eastern counties were nearly one degree cooler than average. July is usually the warmest month of the year.

Degree Days

Cooling degree days for July are shown in Table 1. Growing degree days for agricultural applications are presented in Figure 5. During July and August heating degree day statistics will be omitted in order to help reduce printing costs. Please feel free to contact the Colorado Climate Center to obtain needed heating degree day data.

Figure 1. July 1984 precipitation amounts (inches).

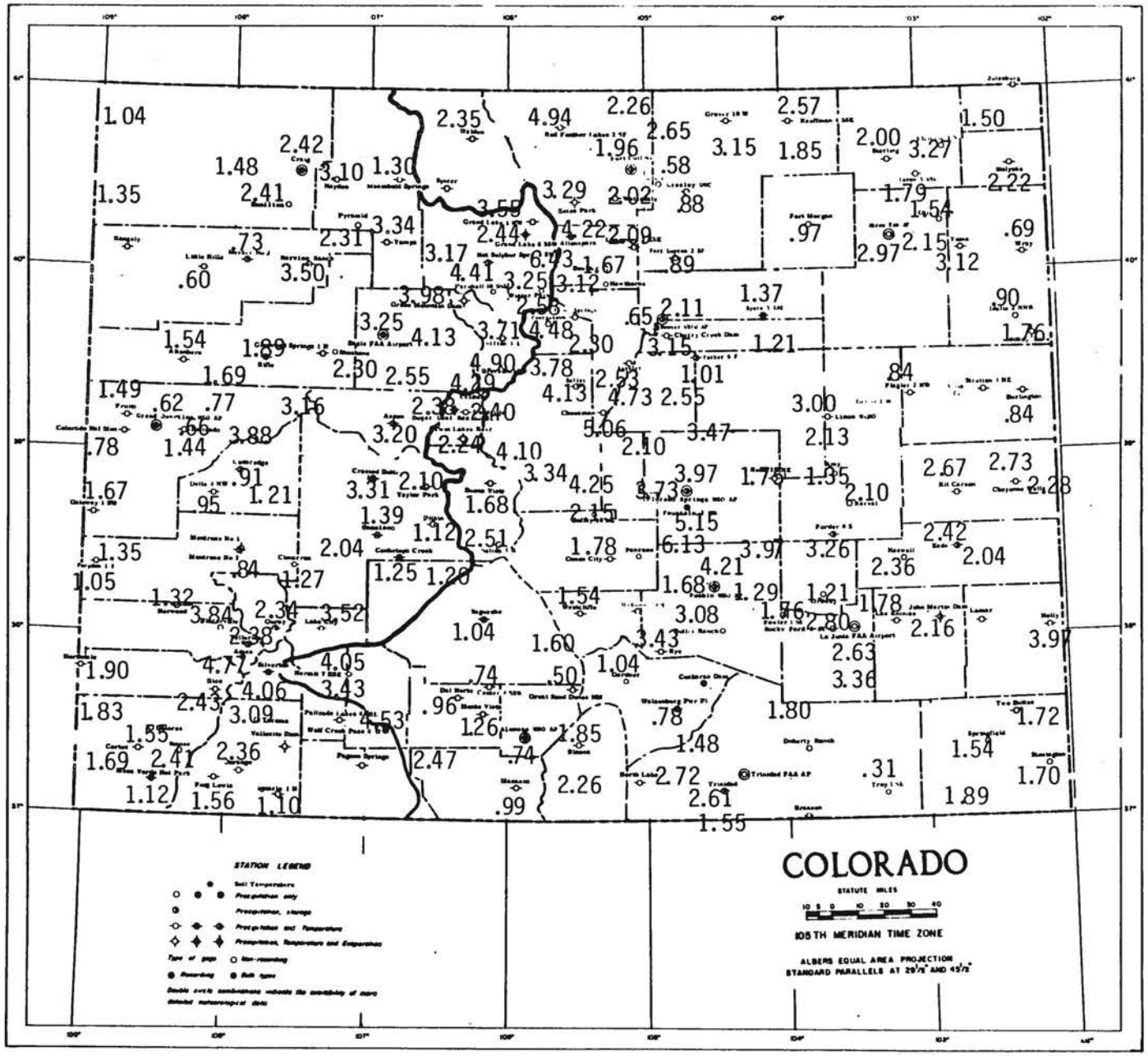

Figure 2. Precipitation for July 1984 as a percent of the 1961-1980 average.

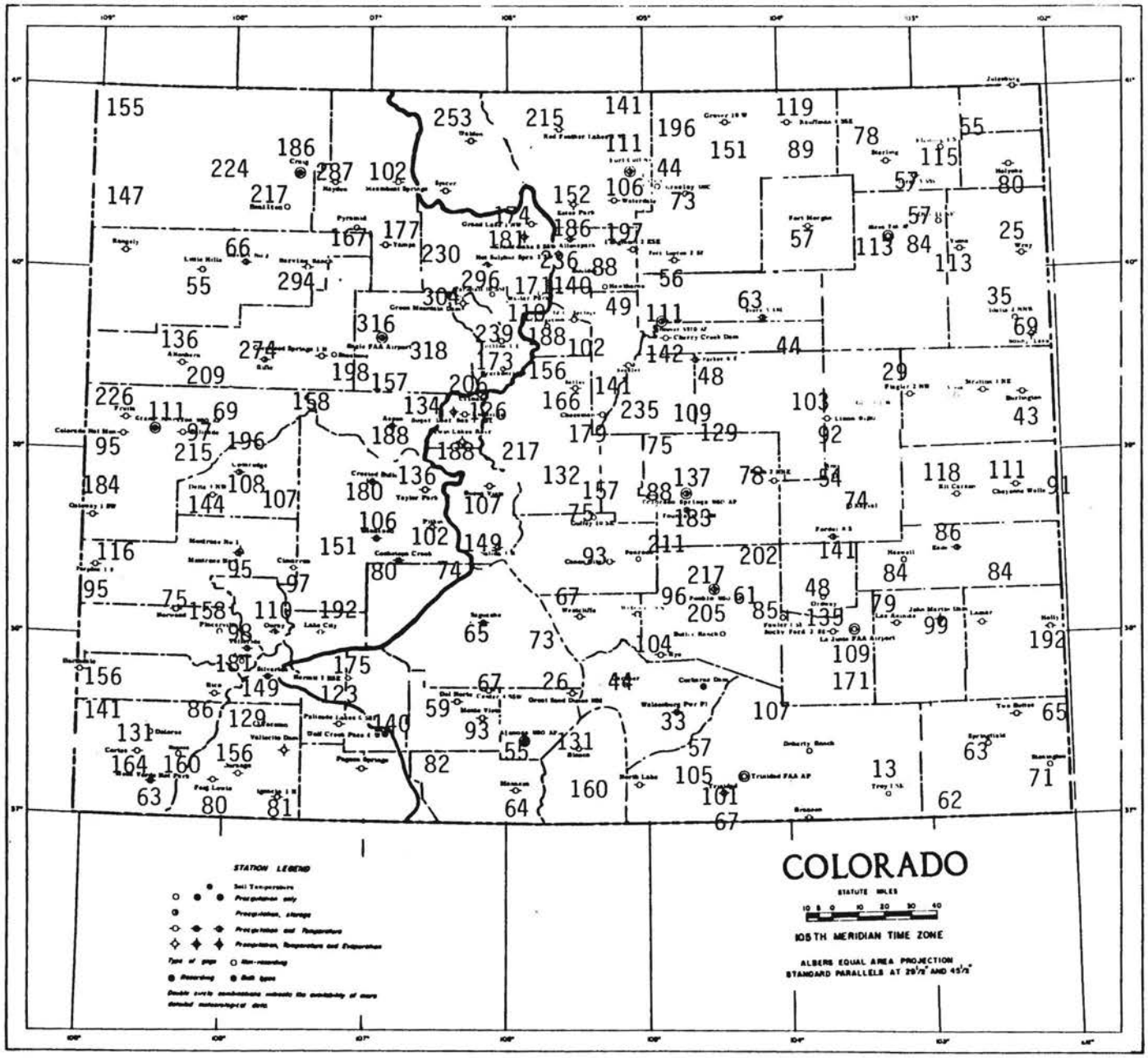

Figure 3. Precipitation for October 1983 through July 1984 as a percent of the 1961-1980 average.

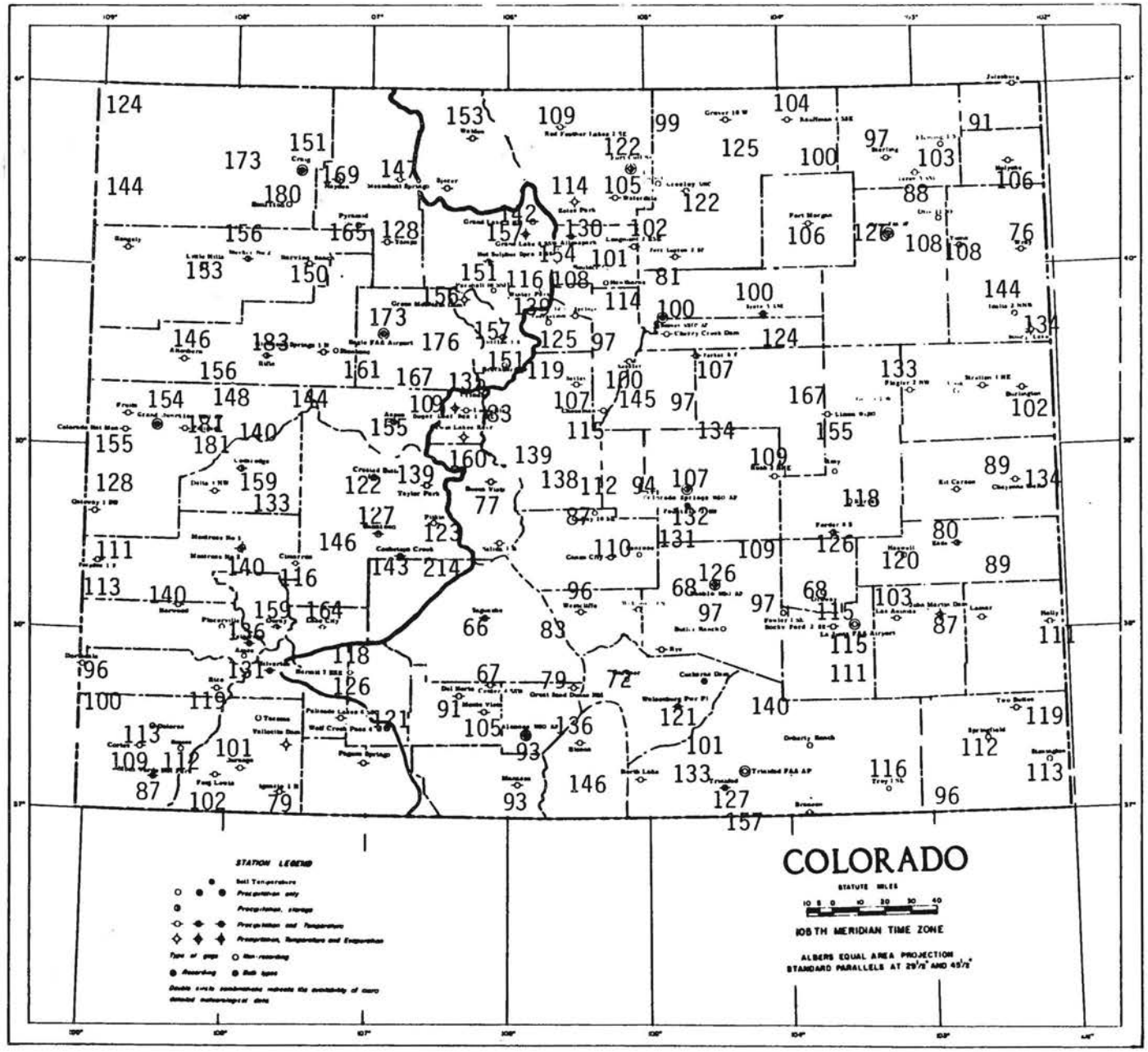

Figure 4. Temperatures for July 1984 in degrees Fahrenheit (in parentheses) and departures from the 1961-1980 average.

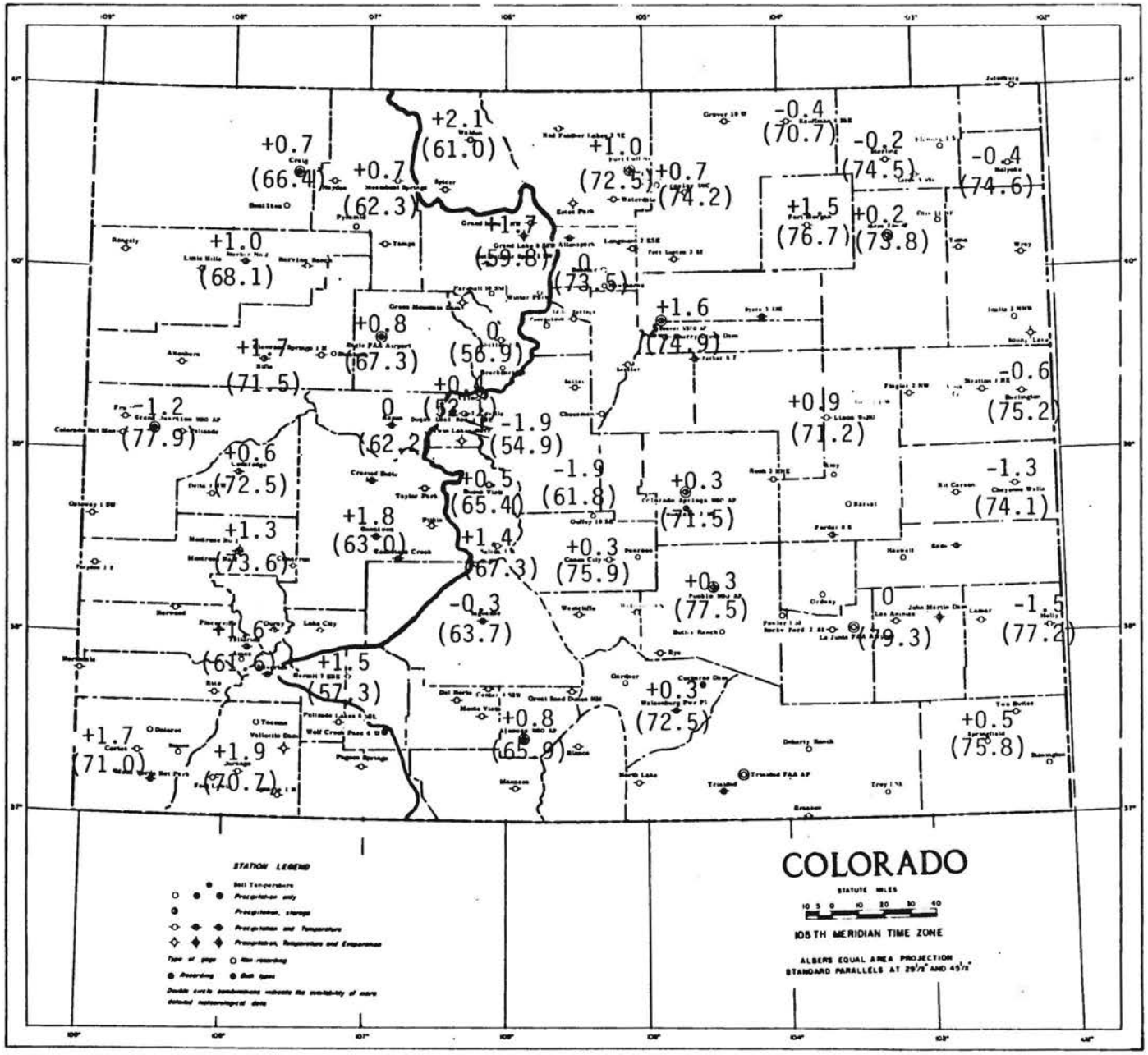

Figure 5. July 1984 growing degree days and total since May 1 (in parentheses). Refer to May issue of Colorado Climate for definition of growing degree days.

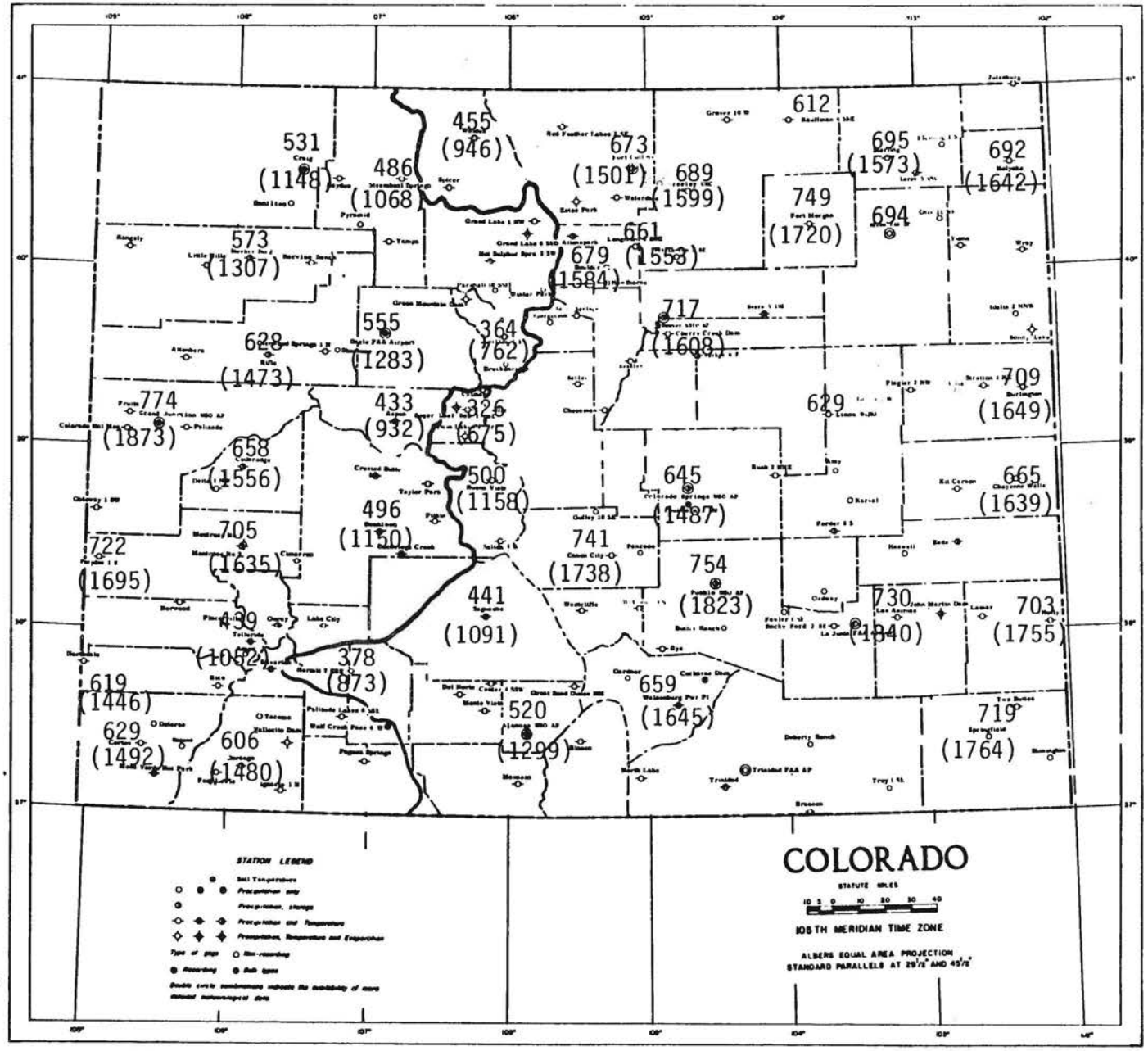

Table 1. Colorado Cooling Degree Day Data through July 1984.

COOLING DEGREE DATA

STATION		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
ALAMOSA	AVE	0	0	0	0	0	9	40	20	0	0	0	0	69
	1983	0	0	0	0	0	4	43	30	1	0	0	0	78
	1984	0	0	0	0	2	1	45						48
ASPEN	AVE	0	0	0	0	0	7	18	11	0	0	0	0	36
	1983	0	0	0	0	0	0	11	13	1	0	0	0	25
	1984	0	0	0	0	0	1	4						5
BOULDER	AVE	0	0	0	0	22	155	283	220	94	16	0	0	790
	1983	0	0	0	0	17	52	249	309	98	0	0	0	725
	1984	0	0	0	0	33	82	271						386
BUENA VISTA	AVE	0	0	0	0	0	13	37	26	0	0	0	0	76
	1983	0	0	0	0	0	1	39	22	2	0	0	0	64
	1984	0	0	0	0	0	6	36						42
BURLING-TON	AVE	0	0	0	0	26	179	325	253	93	11	0	0	887
	1983	0	0	0	0	15	109	360	420	135	1	0	0	1040
	1984	0	0	0	0	18	145	322						485
CANON CITY	AVE	0	0	0	0	33	183	329	266	93	15	0	0	919
	1983	0	0	0	0	10	88	336	328	135	0	0	0	897
	1984	0	0	0	0	56	134	344						534
COLORADO SPRINGS	AVE	0	0	0	0	8	99	200	149	45	0	0	0	501
	1983	0	0	0	0	1	48	236	219	71	0	0	0	575
	1984	0	0	0	0	17	68	207						292
CORTEZ	AVE	0	0	0	0	6	77	214	154	22	0	0	0	473
	1983	0	0	0	0	7	22	150	169	46	0	0	0	394
	1984	0	0	0	0	17	57	194						268
CRAIG	AVE	0	0	0	0	0	13	82	49	8	0	0	0	152
	1983	0	0	0	0	0	7	83	134	17	0	0	0	241
	1984	0	0	0	0	3	6	70						79
DELTA	AVE	0	0	0	0	21	115	282	208	52	0	0	0	678
	1983	0	0	0	0	14	74	263	328	121	0	0	0	800
	1984	0	0	0	0	11		322						333
DENVER	AVE	0	0	0	0	11	134	261	203	63	8	0	0	680
	1983	0	0	0	0	7	69	264	301	91	0	0	0	732
	1984	0	0	0	0	33	104	315						452
DILLON	AVE	0	0	0	0	0	0	0	0	0	0	0	0	0
	1983	0	0	0	0	0	0	0	0	0	0	0	0	0
	1984	0	0	0	0	0	0	0						0
DURANGO	AVE	0	0	0	0	0	20	111	71	7	0	0	0	209
	1983	0	0	0	0	1	9	159	152	24	0	0	0	345
	1984	0	0	0	0	6	33	186						225
EAGLE	AVE	0	0	0	0	0	9	71	39	0	0	0	0	119
	1983	0	0	0	0	0	1	65	112	9	0	0	0	187
	1984	0	0	0	0	0	3	81						84
EVER-GREEN	AVE													
	1983	0	0	0	0	0	0	28	25	8	0	0	0	61
	1984	0	0	0	0	0	1	41						42
FORT COLLINS	AVE	0	0	0	0	5	100	204	132	30	0	0	0	471
	1983	0	0	0	0	8	56	220	281	51	0	0	0	616
	1984	0	0	0	0	15	65	237						317
FORT MORGAN	AVE	0	0	0	0	16	155	304	223	62	0	0	0	760
	1983	0	0	0	0	17	97	341	424	144	1	0	0	1024
	1984	0	0	0	0	59	149	369						577
GRAND JUNCTION	AVE	0	0	0	0	58	238	431	338	128	12	0	0	1205
	1983	0	0	0	0	49	171	422	483	226	3	0	0	1354
	1984	0	0	0	0	130	200	408						738

COOLING DEGREE DATA

STATION		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
GRAND LAKE	AVE	0	0	0	0	0	0	0	0	0	0	0	0	0
	1983	0	0	0	0	0	0	0	0	0	0	0	0	0
	1984	0	0	0	0	0	0	0						0
GREELEY	AVE	0	0	0	0	15	130	267	185	50	0	0	0	647
	1983	0	0	0	0	5	83	257	319	65	0	0	0	729
	1984	0	0	0	0	34	97	293						424
GUNNISON	AVE	0	0	0	0	0	0	9	9	0	0	0	0	18
	1983	0	0	0	0	0	0	16	16	0	0	0	0	32
	1984	0	0	0	0	0	0	9						9
LAS ANIMAS	AVE	0	0	0	6	53	270	425	344	120	8	0	0	1226
	1983	0	0	0	6	34	201	516	512	256	11	0	0	1536
	1984	0	0	0	0	95	289	452						836
LEAD-VILLE	AVE	0	0	0	0	0	0	0	0	0	0	0	0	0
	1983	0	0	0	0	0	0	0	0	0	0	0	0	0
	1984	0	0	0	0	0	0	0						0
LIMON	AVE	0	0	0	0	8	97	206	158	39	8	0	0	516
	1983	0	0	0	0	1	36	215	239	76	0	0	0	567
	1984	0	0	0	0	5	46	199						250
LONGMONT	AVE	0	0	0	0	8	117	227	158	45	0	0	0	555
	1983	0	0	0	0	11	82	263	315	89	0	0	0	760
	1984	0	0	0	0	31	99	267						397
MEEKER	AVE	0	0	0	0	0	14	87	49	12	0	0	0	162
	1983	0	0	0	0	0	2	79	127	21	0	0	0	229
	1984	0	0	0	0	0	14	102						116
MONTROSE	AVE	0	0	0	0	12	120	242	162	45	0	0	0	581
	1983	0	0	0	0	11	80	233	240	88	0	0	0	652
	1984	0	0	0	0	58	91	275						424
PAGOSA SPRINGS	AVE	0	0	0	0	0	8	51	27	0	0	0	0	86
	1983	0	0	0	0	0	2	35	42	11	0	0	0	90
	1984	0	0	0	0	0	1							1
PUEBLO	AVE	0	0	0	0	39	212	369	295	119	8	0	0	1042
	1983	0	0	0	0	16	120	391	391	149	0	0	0	1067
	1984	0	0	0	0	76	208	395						679
RIFLE	AVE	0	0	0	0	0	46	167	117	15	0	0	0	345
	1983	0	0	0	0	0	29	178	249	57	0	0	0	513
	1984	0	0	0	0	8	30	209						247
STEAMBOAT SPRINGS	AVE	0	0	0	0	0	0	11	7	0	0	0	0	18
	1983	0	0	0	0	0	0	3	21	2	0	0	0	26
	1984	0	0	0	0	0	0	10						10
STERLING	AVE	0	0	0	0	15	147	293	214	52	0	0	0	721
	1983	0	0	0	0	12	84	301	398	101	2	0	0	898
	1984	0	0	0	0	22	110	304						436
TELLURIDE	AVE	0	0	0	0	0	0	0	0	0	0	0	0	0
	1983	0	0	0	0	0	0	2	1	0	0	0	0	3
	1984	0	0	0	0	0	0	2						2
TRINIDAD	AVE	0	0	0	0	18	155	279	216	68	5	0	0	741
	1983	0	0	0	0	1	100	327	319	167	0	0	0	914
	1984	0	0	0	0	63	125							188
WALDEN	AVE	0	0	0	0	0	0	0	0	0	0	0	0	0
	1983	0	0	0	0	0	0	1	2	0	0	0	0	3
	1984	0	0	0	0	0	0	3						3
WALSEN-BURG	AVE	0	0	0	0	8	109	219	157	45	0	0	0	538
	1983	0	0	0	0	2	67	266	250	108	2	0	0	695
	1984	0	0	0	0	47	91	244						382

COLORADO CLIMATE -- AUGUST 1984

Colorado Climate Center
Department of Atmospheric Science
Fort Collins, Colorado 80523

Rain fell frequently and sometimes heavily over much of Colorado from the Front Range west to Utah in August as the southwest monsoon persisted. Temperatures were mild to hot over all the state, especially the Eastern Plains.

Significant Highlights -- August

Date	Event
1-2	Seasonal temperatures statewide. Lots of thunderstorm activity from the mountains eastward. Aspen recorded 1.00" on the 1st while Fort Morgan totalled 1.58" that night.
3-7	Little change. Scattered showers and thunderstorms became numerous on the 5-7th as another surge of tropical air drifted northward into the state. Littleton reported 1.04" on the 5th, 2.20" near Akron on the 6th, and 1.53" at Stonington on the 7th. Several inches of small hail were also reported on the 7th at Allenspark.
8-16	A little drier air moved into the state on 8-11 but some scattered thundershowers still developed each day. A few chilly temperatures were noted such as 38°F at Alamosa on the 9th and 32° at Leadville on the 10th. Plenty of sunshine on the 11th permitted the warmest temperatures of the month to occur in northwestern Colorado including 87° at Steamboat and 92° at Rifle. An increase in tropical moisture then began again resulting in more cloudiness and heavier storms. Denver picked up 1.00" of rain on the 12th. Northdale, near the Utah border, got 1.15" on the 14th in a short period producing local flooding.
17-25	Warm, humid, stormy and wet. Large, slow-moving thunderstorms developed each day, especially over and near the mountains. During the period there were 50 separate official reports of at least one inch of rain in 24 hours. Examples include 1.72" at Eleven Mile Reservoir on the 17th, 2.12" at Bailey on the 18th, 1.29" at Troy on the 19th, 1.97" at Evergreen and 1.46" at Rifle on the 20th, 1.42" at Pueblo on the 21st, 1.20" at Manassa on the 22nd, 1.13" at Uravan on the 23rd and 1.76" near Tacony (northeast of Pueblo) on the 24th. The greatest 24-hour rainfall officially recorded in Colorado this August was 3.27" at

Fowler on the 21st. These heavy rains slowed construction work and made outdoor recreation a bit of a challenge. Several major rivers, including the South Platte, flowed high and murky during this period.

26-31 For the first time in many weeks the jet stream drifted southward far enough to cut off the flow of moist tropical air into Colorado. Hot, dry westerly winds developed over and east of the mountains. This same weather pattern whipped forest fires into uncontrollable infernos over Montana. Colorado was spared this misery but instead felt "chapped-lip weather" as temperatures climbed into the 90s and low 100s while dewpoints stayed in the 30s. Boulder hit 95° and Julesburg hit 100° on the 28th, Greeley 94° on the 29th. Holly claimed the distinction of Colorado's hot spot with 105° readings on the 28th, 29th and 30th. But the dry weather also allowed autumn-like temperatures at night in the mountains. Meeker cooled to 39° on the 31st and Walden had a nippy 33° on the 30th. Old reliable Taylor Park Reservoir was the state's cold spot for the month with 26°F on the morning of the 28th. An isolated storm dropped an inch or more of rain from Kremmling to Grand Lake on the 28th. Then on the 31st, clouds and thunderstorms moved into the state in advance of a fairly strong cold front.

Precipitation Summary

Precipitation totals for August and percents of average are shown in Figures 1 and 2. With the persisting presence of tropical moisture, rainfall was heavy over much of the state. At least one official weather station reported an inch or more of rainfall on 15 separate days while on 25 days at least 0.50" fell. Nearly 50 stations had at least 4" of rain for the month. Bailey's 8.71" total was the greatest in the state. Nearly all locations from the Front Range cities westward to Utah were wetter than average. New rainfall records for August were set at Bailey (8.71"), Lake George 8SW (7.26"), Sedalia 4SSE (6.95"), Grand Lake 1NW (6.12"), Evergreen (5.44"), Kassler (4.86") and Eagle (3.04").

As always, not all of Colorado experienced an abundance of rain. Dry conditions were observed in a small area near Loveland and Fort Collins, in the vicinity of Rye and Westcliffe, and over much of the Eastern Plains. Fort Collins received only 0.57", 42% of average. Sedgwick's 0.47" total was only 31% of average. Drought conditions developed quickly in the lower Arkansas Valley. Holly, for example, only received 0.05" of rain in August (3% of average) while temperatures exceeded 95° on 16 days.

Water Year Precipitation to Date

The 1984 water year is now nearly complete. Most of the state has had above or much above average precipitation this year and a few stations are approaching their wettest year on record. Rifle and Eagle, for example, are each 90% above their average. The only drier than average locations are scattered across the Eastern Plains and on either side of the Sangre de Cristo Mountains in south central Colorado.

Temperature Summary

August was a warm month over most of Colorado (Figure 4). Temperatures ranged from close to average in the center of the state to nearly 4 degrees Fahrenheit above average on the northeast plains. Over the wet areas, daytime temperatures were near or even a little cooler than average. But this was more than made up for the by unusually warm nighttime readings which were as much as 5 degrees above average.

Degree Days

Cooling degree days for July are shown in Table 1. Growing degree days for agricultural applications are presented in Figure 5. Heating degree days are not shown this month but will again be included beginning with the September issue of this report.

Figure 1. August 1984 precipitation amounts (inches).

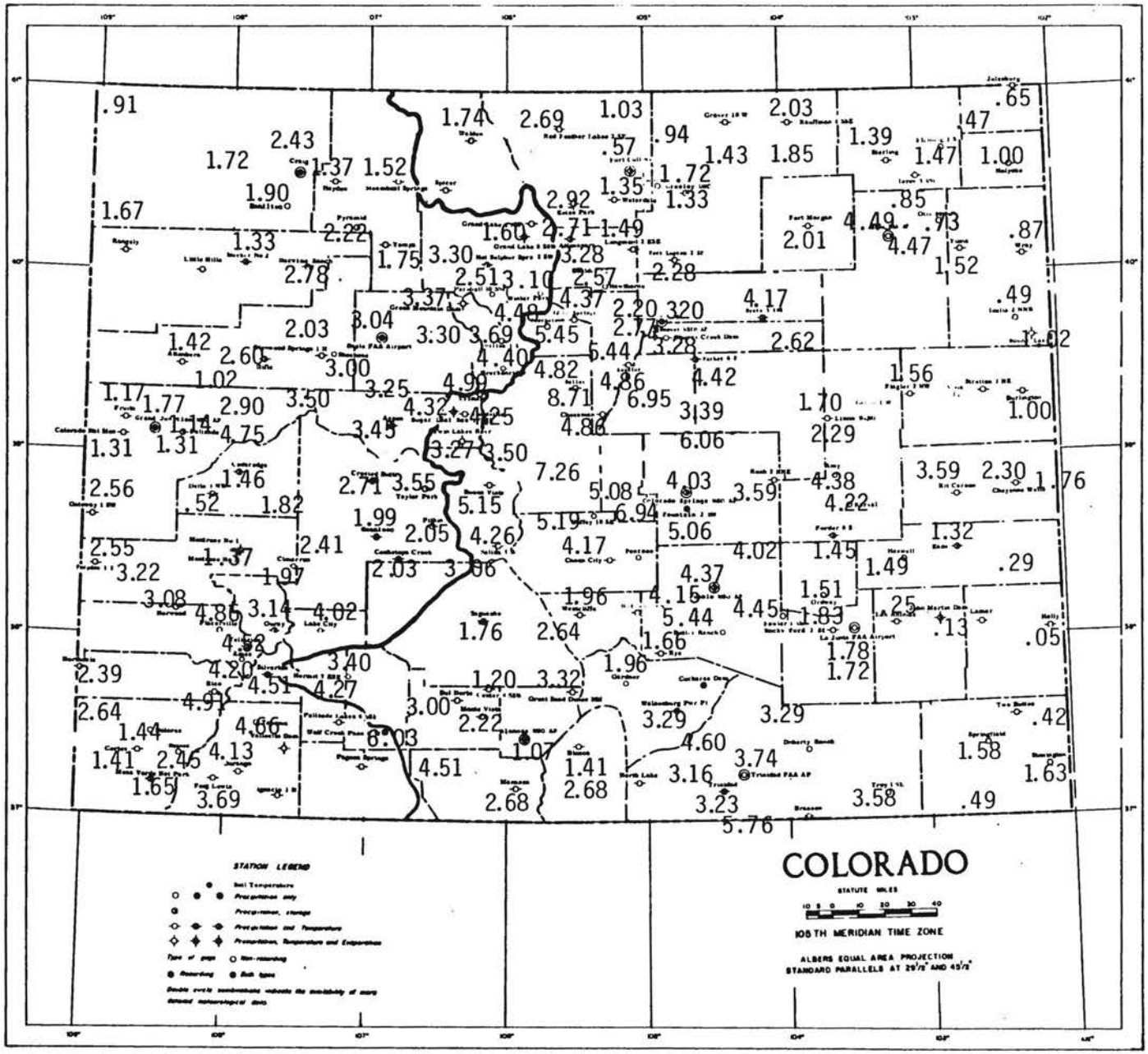

Figure 2. Precipitation for August 1984 as a percent of the 1961-1980 average.

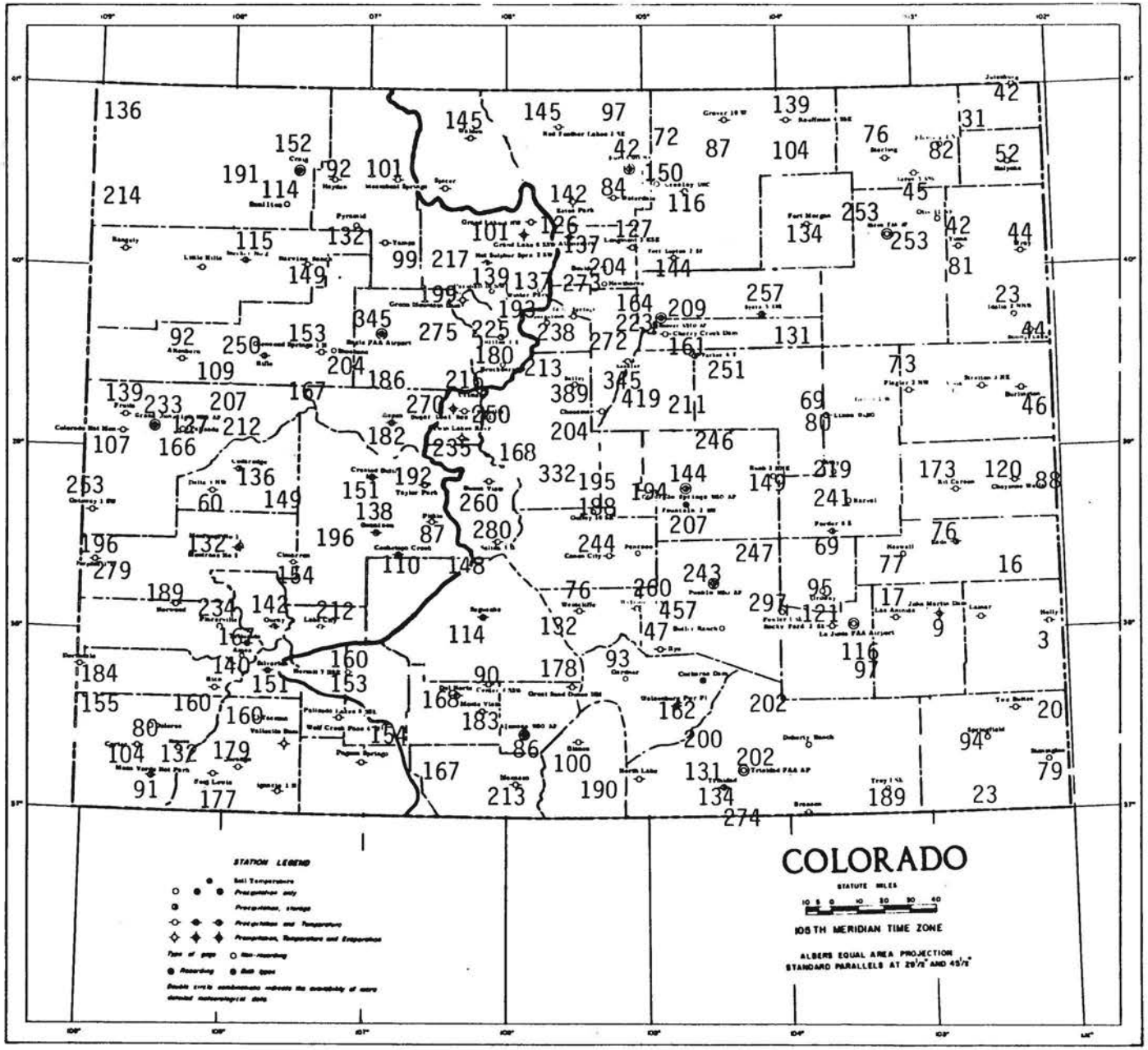

Figure 3. Precipitation for October 1983 through August 1984 as a percent of the 1961-1980 average.

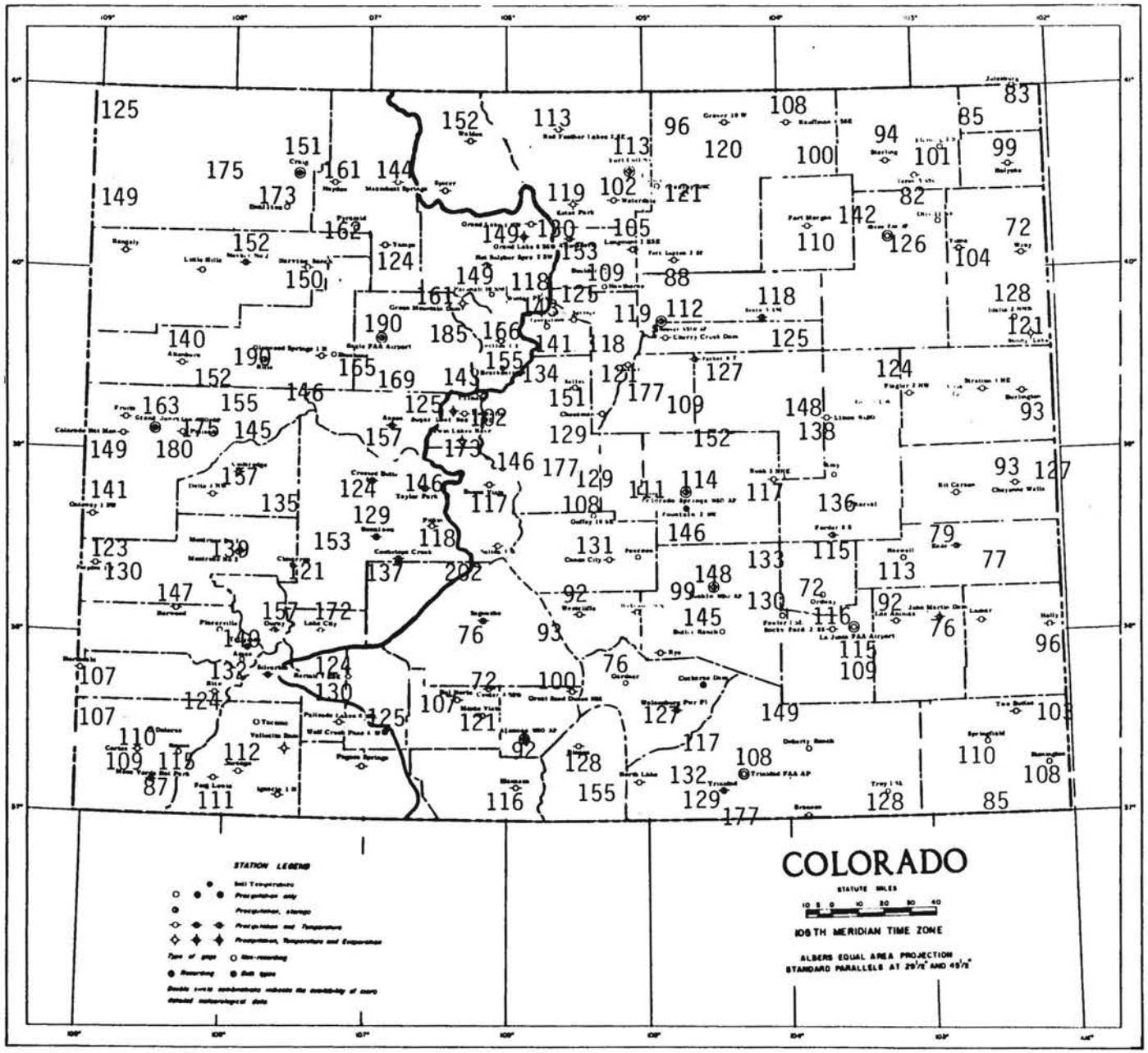

Figure 4. Temperatures for August 1984 in degrees Fahrenheit (in parentheses) and departures from the 1961-1980 average.

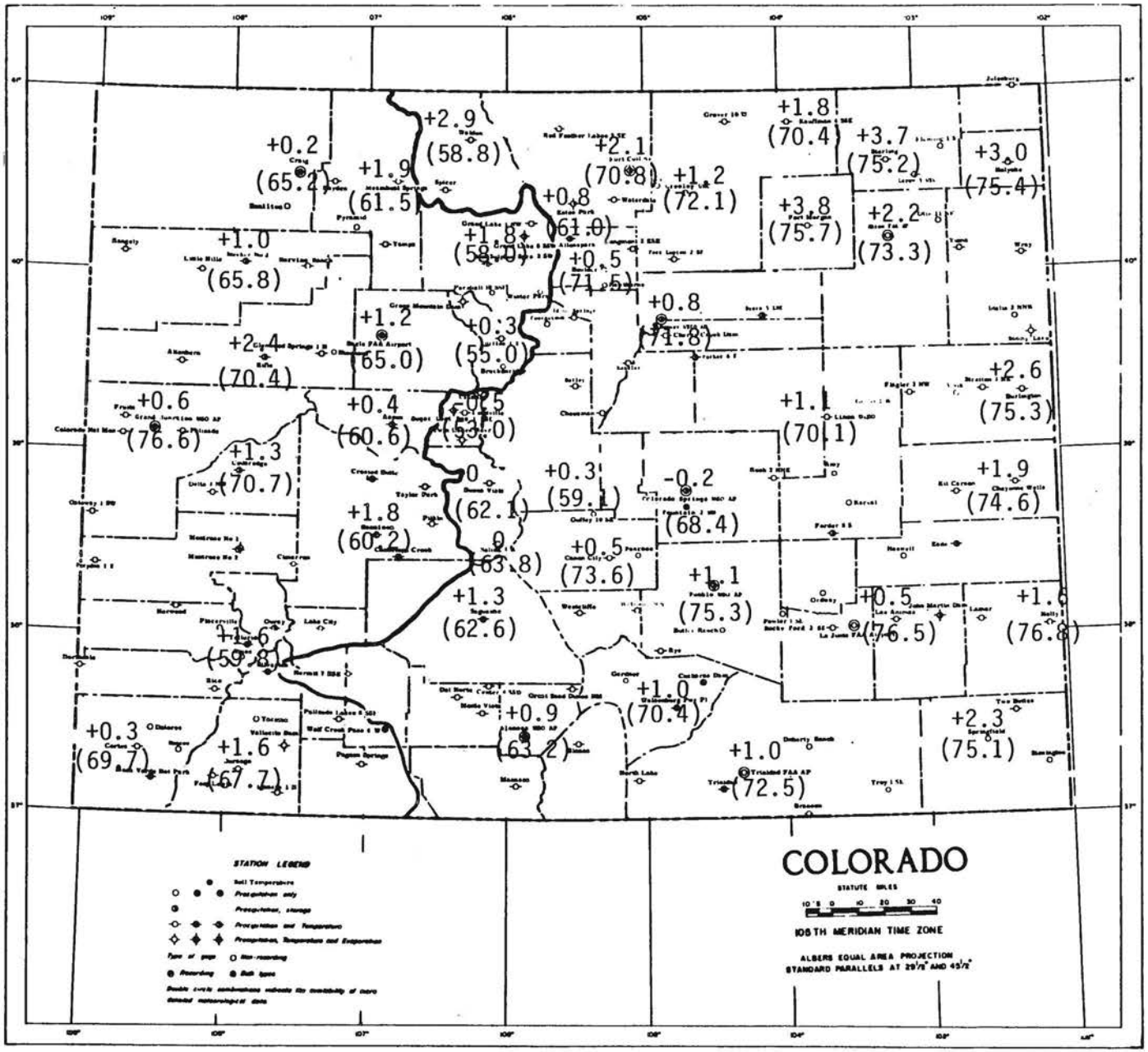

Figure 5. August 1984 growing degree days and total since May 1 (in parentheses). Refer to May issue of Colorado Climate for definition of growing degree days.

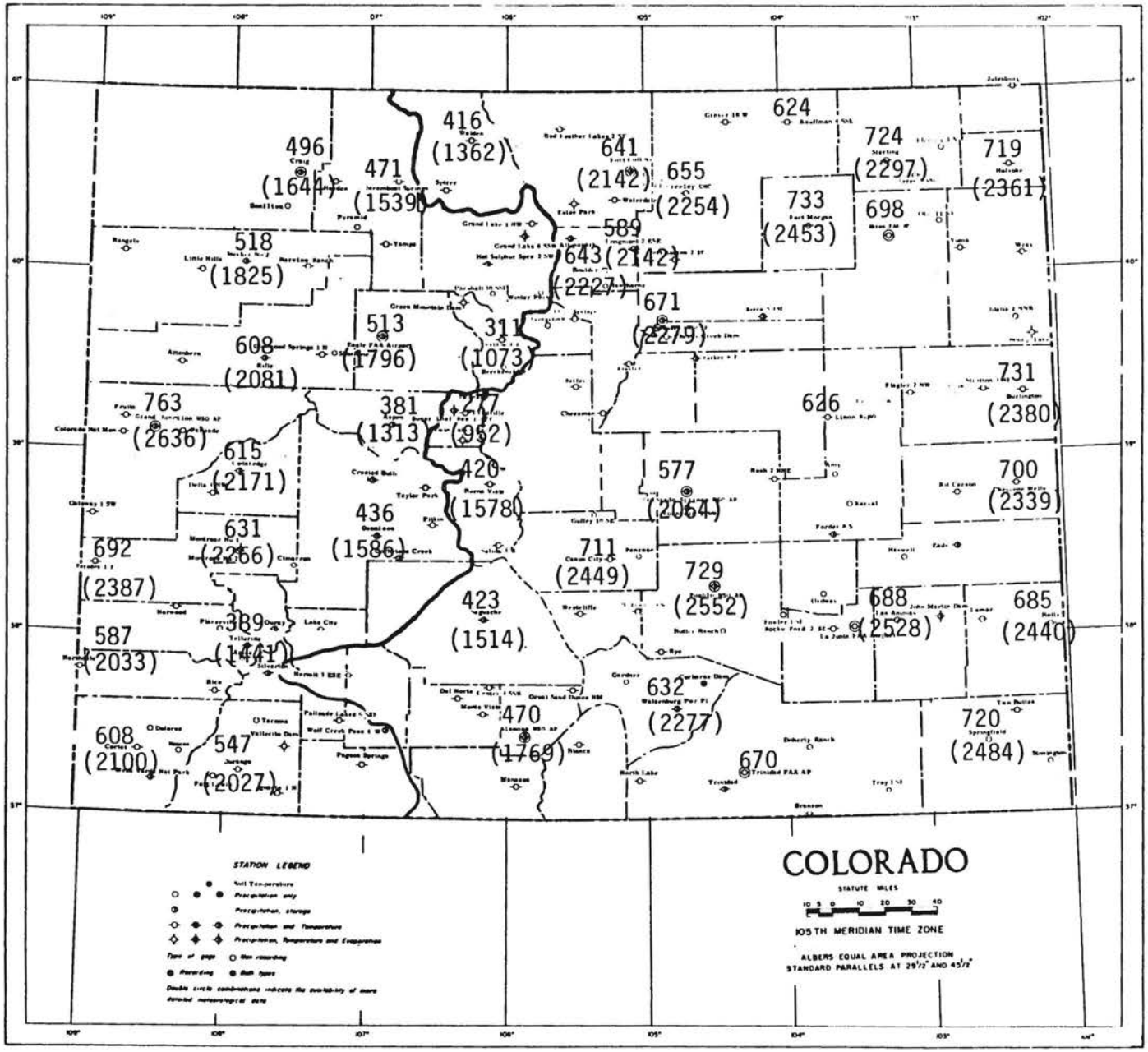

Table 1. Cooling Degree Day Data for Colorado through August 1984.

COOLING DEGREE DATA

STATION		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
ALAMOSA	AVE	0	0	0	0	0	9	40	20	0	0	0	0	69
	1983	0	0	0	0	0	4	43	30	1	0	0	0	78
	1984	0	0	0	0	2	1	45	8					48
ASPEN	AVE	0	0	0	0	0	7	18	11	0	0	0	0	36
	1983	0	0	0	0	0	0	11	13	1	0	0	0	25
	1984	0	0	0	0	0	1	4	1					5
BOULDER	AVE	0	0	0	0	22	155	283	220	94	16	0	0	790
	1983	0	0	0	0	17	52	249	309	98	0	0	0	725
	1984	0	0	0	0	33	82	271	211					386
BUENA VISTA	AVE	0	0	0	0	0	13	37	26	0	0	0	0	76
	1983	0	0	0	0	0	1	39	22	2	0	0	0	64
	1984	0	0	0	0	0	6	36	8					42
BURLING-TON	AVE	0	0	0	0	26	179	325	253	93	11	0	0	887
	1983	0	0	0	0	15	109	360	420	135	1	0	0	1040
	1984	0	0	0	0	18	145	322	328					485
CANON CITY	AVE	0	0	0	0	33	183	329	266	93	15	0	0	919
	1983	0	0	0	0	10	88	336	328	135	0	0	0	897
	1984	0	0	0	0	56	134	344	273					534
COLORADO SPRINGS	AVE	0	0	0	0	8	99	200	149	45	0	0	0	501
	1983	0	0	0	0	1	48	236	219	71	0	0	0	575
	1984	0	0	0	0	17	68	207	119					292
CORTEZ	AVE	0	0	0	0	6	77	214	154	22	0	0	0	473
	1983	0	0	0	0	7	22	150	169	46	0	0	0	394
	1984	0	0	0	0	17	57	194	154					268
CRAIG	AVE	0	0	0	0	0	13	82	49	8	0	0	0	152
	1983	0	0	0	0	0	7	83	134	17	0	0	0	241
	1984	0	0	0	0	3	6	70	38					79
DELTA	AVE	0	0	0	0	21	115	282	208	52	0	0	0	678
	1983	0	0	0	0	14	74	263	328	121	0	0	0	800
	1984	0	0	0	0	11	--	322	221					333
DENVER	AVE	0	0	0	0	11	134	261	203	63	8	0	0	680
	1983	0	0	0	0	7	69	264	301	91	0	0	0	732
	1984	0	0	0	0	33	104	315	218					452
DILLON	AVE	0	0	0	0	0	0	0	0	0	0	0	0	0
	1983	0	0	0	0	0	0	0	0	0	0	0	0	0
	1984	0	0	0	0	0	0	0	0					0
DURANGO	AVE	0	0	0	0	0	20	111	71	7	0	0	0	209
	1983	0	0	0	0	1	9	159	152	24	0	0	0	345
	1984	0	0	0	0	6	33	186	99					225
EAGLE	AVE	0	0	0	0	0	9	71	39	0	0	0	0	119
	1983	0	0	0	0	0	1	65	112	9	0	0	0	187
	1984	0	0	0	0	0	3	81	34					84
EVER-GREEN	AVE													
	1983	0	0	0	0	0	0	28	25	8	0	0	0	61
	1984	0	0	0	0	0	1	41	9					42
FORT COLLINS	AVE	0	0	0	0	5	100	204	132	30	0	0	0	471
	1983	0	0	0	0	8	56	220	281	51	0	0	0	616
	1984	0	0	0	0	15	65	237	190					317
FORT MORGAN	AVE	0	0	0	0	16	155	304	223	62	0	0	0	760
	1983	0	0	0	0	17	97	341	424	144	1	0	0	1024
	1984	0	0	0	0	59	149	369	336					577
GRAND JUNCTION	AVE	0	0	0	0	58	238	431	338	128	12	0	0	1205
	1983	0	0	0	0	49	171	422	483	226	3	0	0	1354
	1984	0	0	0	0	130	200	408	368					738

COOLING DEGREE DATA

STATION		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
GRAND LAKE	AVE	0	0	0	0	0	0	0	0	0	0	0	0	0
	1983	0	0	0	0	0	0	0	0	0	0	0	0	0
	1984	0	0	0	0	0	0	0	0					0
GREELEY	AVE	0	0	0	0	15	130	267	185	50	0	0	0	647
	1983	0	0	0	0	5	83	257	319	65	0	0	0	729
	1984	0	0	0	0	34	97	293	225					424
GUNNISON	AVE	0	0	0	0	0	0	9	9	0	0	0	0	18
	1983	0	0	0	0	0	0	16	16	0	0	0	0	32
	1984	0	0	0	0	0	0	9	0					9
LAS ANIMAS	AVE	0	0	0	6	53	270	425	344	120	8	0	0	1226
	1983	0	0	0	6	34	201	516	512	256	11	0	0	1536
	1984	0	0	0	0	95	289	452	362					836
LEAD-VILLE	AVE	0	0	0	0	0	0	0	0	0	0	0	0	0
	1983	0	0	0	0	0	0	0	0	0	0	0	0	0
	1984	0	0	0	0	0	0	0	0					0
LIMON	AVE	0	0	0	0	8	97	206	158	39	8	0	0	516
	1983	0	0	0	0	1	36	215	239	76	0	0	0	567
	1984	0	0	0	0	5	46	199	169					250
LONGMONT	AVE	0	0	0	0	8	117	227	158	45	0	0	0	555
	1983	0	0	0	0	11	82	263	315	89	0	0	0	760
	1984	0	0	0	0	31	99	267	164					397
MEEKER	AVE	0	0	0	0	0	14	87	49	12	0	0	0	162
	1983	0	0	0	0	0	2	79	127	21	0	0	0	229
	1984	0	0	0	0	0	14	102	51					116
MONTROSE	AVE	0	0	0	0	12	120	242	162	45	0	0	0	581
	1983	0	0	0	0	11	80	233	240	88	0	0	0	652
	1984	0	0	0	0	58	91	275	189					424
PAGOSA SPRINGS	AVE	0	0	0	0	0	8	51	27	0	0	0	0	86
	1983	0	0	0	0	0	2	35	42	11	0	0	0	90
	1984	0	0	0	0	0	1							1
PUEBLO	AVE	0	0	0	0	39	212	369	295	119	8	0	0	1042
	1983	0	0	0	0	16	120	391	391	149	0	0	0	1067
	1984	0	0	0	0	76	208	395	328					679
RIFLE	AVE	0	0	0	0	0	46	167	117	15	0	0	0	345
	1983	0	0	0	0	0	29	178	249	57	0	0	0	513
	1984	0	0	0	0	8	30	209	175					247
STEAMBOAT SPRINGS	AVE	0	0	0	0	0	0	11	7	0	0	0	0	18
	1983	0	0	0	0	0	0	3	21	2	0	0	0	26
	1984	0	0	0	0	0	0	10	2					10
STERLING	AVE	0	0	0	0	15	147	293	214	52	0	0	0	721
	1983	0	0	0	0	12	84	301	398	101	2	0	0	898
	1984	0	0	0	0	22	110	304	326					436
TELLURIDE	AVE	0	0	0	0	0	0	0	0	0	0	0	0	0
	1983	0	0	0	0	0	0	2	1	0	0	0	0	3
	1984	0	0	0	0	0	0	2	0					2
TRINIDAD	AVE	0	0	0	0	18	155	279	216	68	5	0	0	741
	1983	0	0	0	0	1	100	327	319	167	0	0	0	914
	1984	0	0	0	0	63	125	299	238					188
WALDEN	AVE	0	0	0	0	0	0	0	0	0	0	0	0	0
	1983	0	0	0	0	0	0	1	2	0	0	0	0	3
	1984	0	0	0	0	0	0	3	0					3
WALSEN-BURG	AVE	0	0	0	0	8	109	219	157	45	0	0	0	538
	1983	0	0	0	0	2	67	266	250	108	2	0	0	695
	1984	0	0	0	0	47	91	244	175					382

COLORADO CLIMATE -- SEPTEMBER 1984

Colorado Climate Center
Department of Atmospheric Science
Fort Collins, Colorado 80523

The majority of Colorado was drier than average in September. But several areas in and near the mountains were again quite wet continuing the trend that has persisted for more than a year. Temperatures were generally a little warmer than average in the western half of the state and cooler than average to the east.

Significant Highlights -- September

Date	Event
1-3	A strong cold front crossed the state early on the first and triggered some moderate thunderstorm activity, particularly in western Colorado. Telluride reported 0.86" on the 1st and Marvine Ranch 0.98. Clearing and cooler over most of the state 2-3rd, but rain continued in the San Juans. Wolf Creek Pass totalled 1.55" 1-3rd.
4-6	Hot, dry, summer-like weather. Most reporting stations had their hottest readings for the month on the 5th and 6th with 80s and 90s common. Steamboat Springs hit 83°F on the 5th. Greeley had 94° on the 6th. Denver hit 91° on both the 5th and 6th.
7-8	A cold front from a low pressure area in southern Canada zipped across Colorado. A few widely scattered storms occurred. Allenspark was drenched by 0.89" of rain. Berthoud Pass received a 3" snowfall, the first official snowfall of the season. Strong westerly winds also accompanied the frontal passage.
9-10	Warm and dry statewide with temperatures climbing back up into the 80s and 90s at lower elevations. Holly's 103° reading on the 10th was the warmest in the state in September.
11-13	Mild and more humid with scattered but mostly light shower and thundershower activity over most of the state.
14-16	Much cooler east of the mountains. A huge Canadian high pressure area drifted southeastward into the Midwest causing moist southeasterly "upslope" winds across the Front Range and Eastern Plains. Daytime temperatures stayed in the 50s and low 60s on the 14-15th. Much warmer west of the mountains, but showery as moisture from a dissipated tropical storm lingered

in the area. An upper air disturbance helped produce a round of heavy precipitation on the 15th and 16th. Montrose measured 1.28" on the 16th. Wolf Creek Pass totalled an even 2.00" on the 15-16th. Grand Lake took the cake with 2.22" of rain on the 16th.

17-23 Hot days, cool nights -- beautiful late summer weather. Little or no precipitation east of the mountains, but scattered light showers along and west of the Continental Divide, especially 20-23rd.

24 Summer ended in Colorado literally overnight. A strong arctic surge moved down from the north late on the 23rd, and by the evening of the 24th the ground was snowcovered over much of northern Colorado. Fort Collins measured 2" of white stuff by midnight, and Craig reported 5". Subfreezing temperatures brought an end to the growing season in a few places.

25-27 Temperatures remained well below average, especially east of the mountains.

28-30 A new arctic push moved record-breaking cold into Colorado and brought snow and subfreezing temperatures to all of the Eastern Plains. Snowfall on the 28th was generally 1-4" across all of the Plains. However, Lakewood and Wheat Ridge both reported 8". Broken tree limbs knocked out power in much of the Denver metropolitan area. In southeastern Colorado, new September snowfall records were set at several locations including 4" at Las Animas, 2.5" at Rocky Ford and 5" at Stonington. As the skies cleared some very cold temperatures were reported, such as 28° at Boulder and 24° at Greeley on the 30th and 19° at Holly on the 29th. This was the 2nd consecutive year with an unusually early and severe first frost. Berthoud Pass claimed the Colorado cold spot award for the month with +6°F on the 29th.

Precipitation Summary

Precipitation totals for September and percents of average are shown in Figures 1 and 2. Most locations east of the Continental Divide received less than 1.00" and were considerably drier than normal. Burlington's 0.05" total was just 3% of average. Dry areas were also noted on the Western Slope in the vicinity of Grand Junction, from Breckenridge to Gunnison, and also in the extreme southwest corner of the state. The remainder of western Colorado was wetter than average with most locations reporting their 4th consecutive unusually wet month. The wettest site compared to average was Browns Park Refuge in extreme northwestern Colorado. Their 2.24" total was more than 3 times the average. The highest monthly total in the state was 5.44" at Wolf Creek Pass.

Growing Season Precipitation

Figure 3 shows May-September precipitation as a percent of average. Wetter than average conditions were noted near Akron, in the Front Range foothills, in South Park, in the Arkansas Valley above Fowler, and over almost all of western Colorado. For some areas west of the Divide this has been the wettest summer on record. Avon, Eagle, and Rifle all had well over twice their normal summer precipitation. For Rifle, this was their 2nd consecutive summer with more than 200% of average precipitation.

Colorado's Eastern Plains did not fare as well. Precipitation typically ranged from close to average near the foothills to less than 50% of average near the eastern border. Even in the best of years, it seems that Colorado is never totally free of drought.

Water Year Precipitation to Date

The 1984 water year is now history (Figure 4). It was the 2nd consecutive year of much above average precipitation over Colorado's mountains and western valleys. In the northwest quarter of the state, 23 reporting stations received more than 150% of their annual average. New streamflow records were noted on some tributaries to the Colorado River.

A wet winter helped make this a near average year across the Eastern Plains. The only areas of the state which ended up significantly drier than average were a small portion of the lower Arkansas Valley and northern sections of the San Luis Valley. All in all, Colorado's water supplies are in good shape for this time of year with most reservoirs holding more water than normal and streams still flowing briskly.

Temperature Summary

September temperatures were cooler than average in eastern Colorado and warmer than average in the west (Figure 5). Las Animas and Greeley were each more than 3 degrees Fahrenheit cooler than average while Durango and Montrose were more than 2 degrees above average.

Degree Days

Heating and cooling degree days are presented in Tables 1 and 2, respectively. Growing degree days (Figure 6) are shown for the last time this year.

Figure 1. September 1984 precipitation amounts (inches).

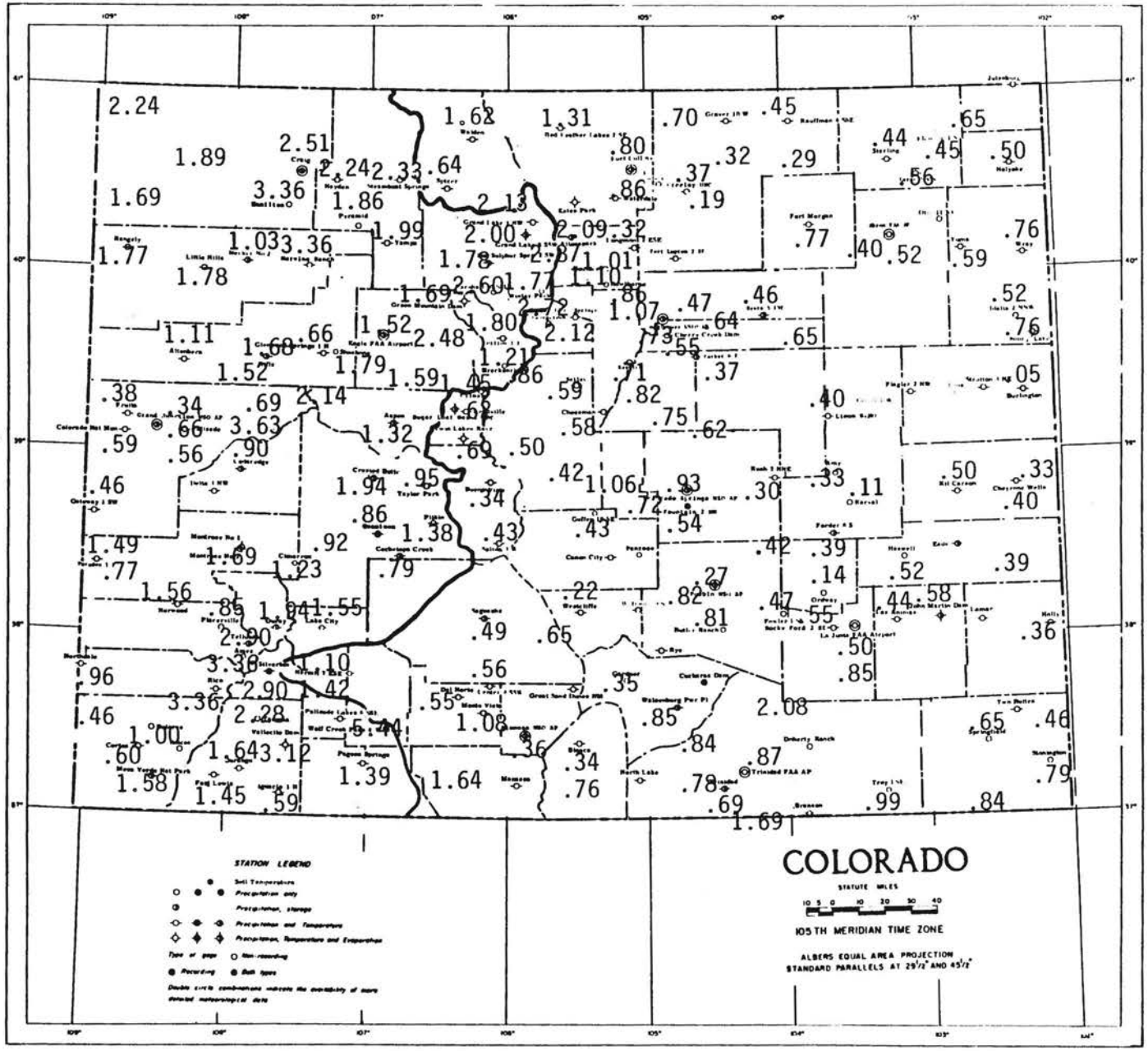

Figure 2. Precipitation for September 1984 as a percent of the 1961-1980 average.

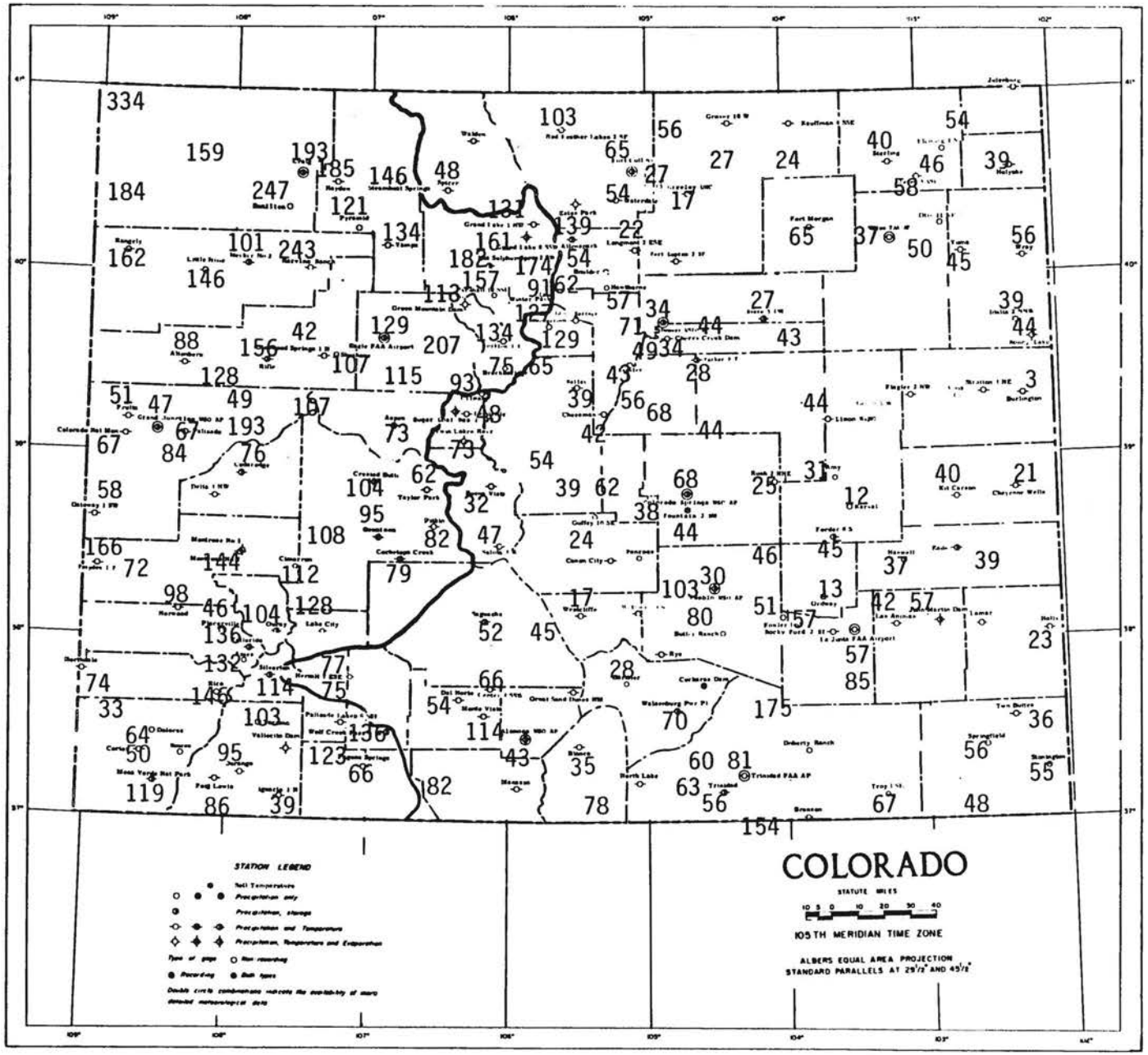

Figure 3. May through September "growing season" precipitation as a percent of the 1961-1980 average.

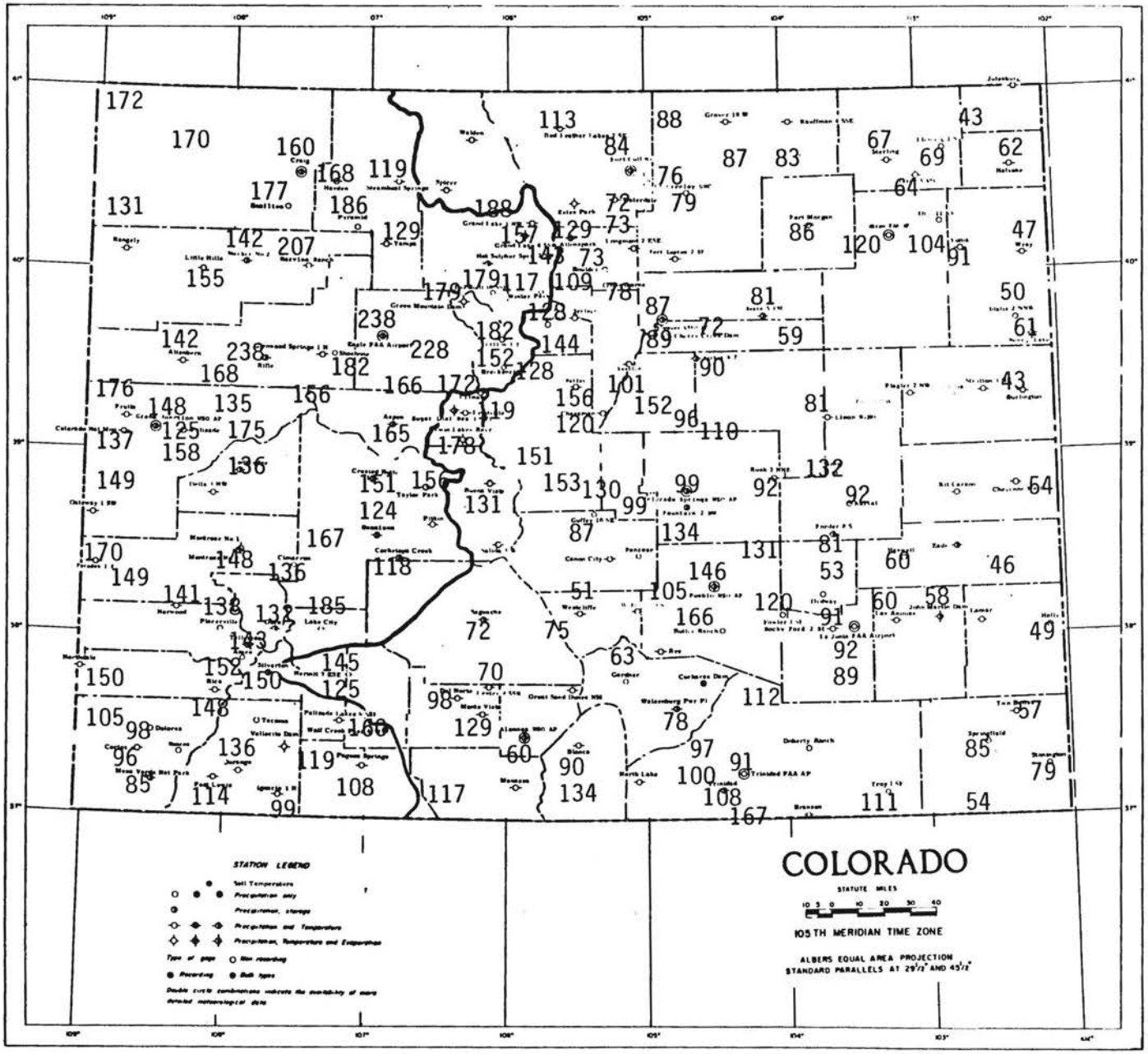

Figure 4. Precipitation for the complete 1984 water-year (October 1983 through September 1984) as a percent of the 1961-1980.

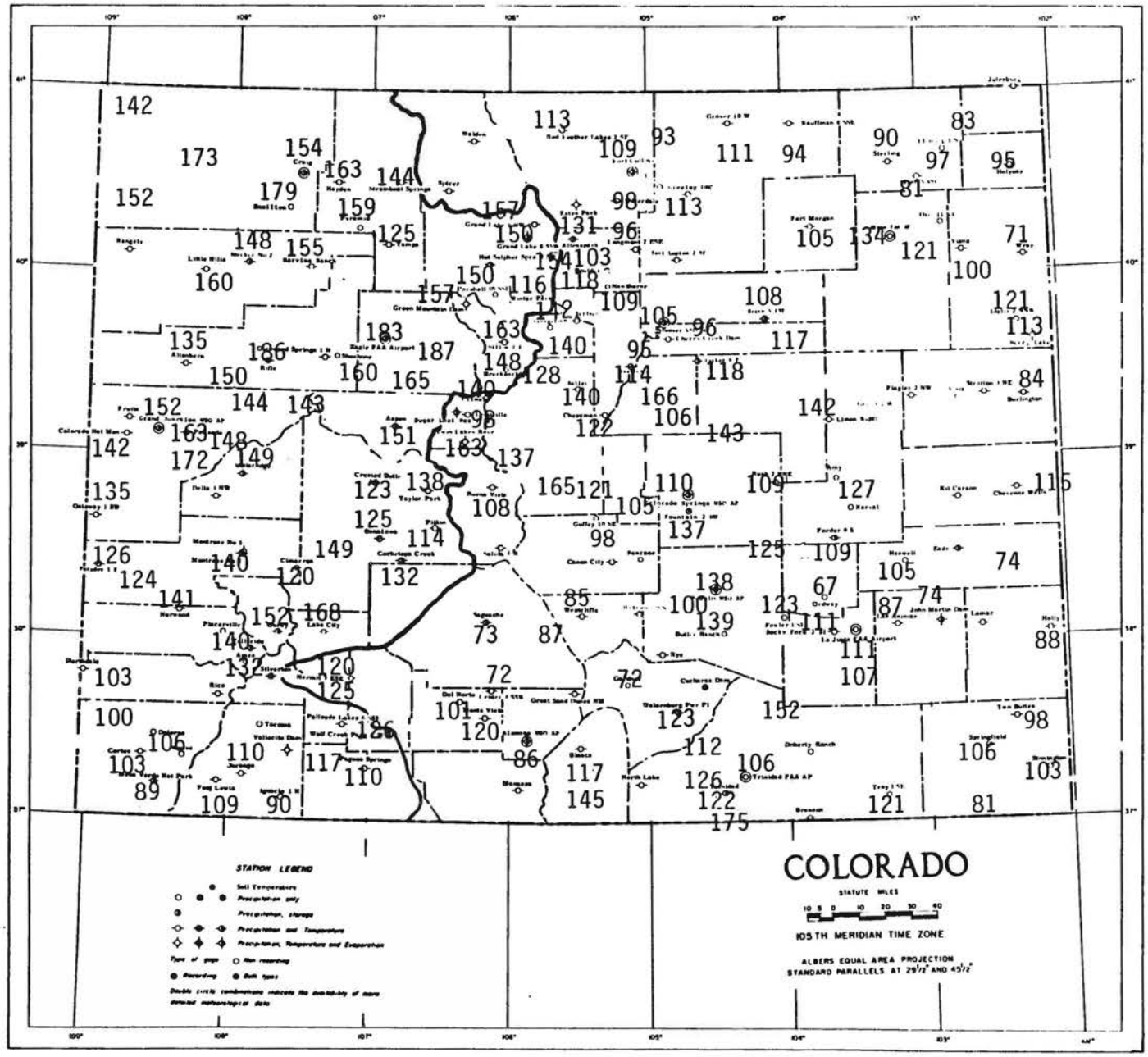

Figure 5. Temperatures for September 1984 in degrees Fahrenheit (in parentheses) and departures from the 1961-1980 average.

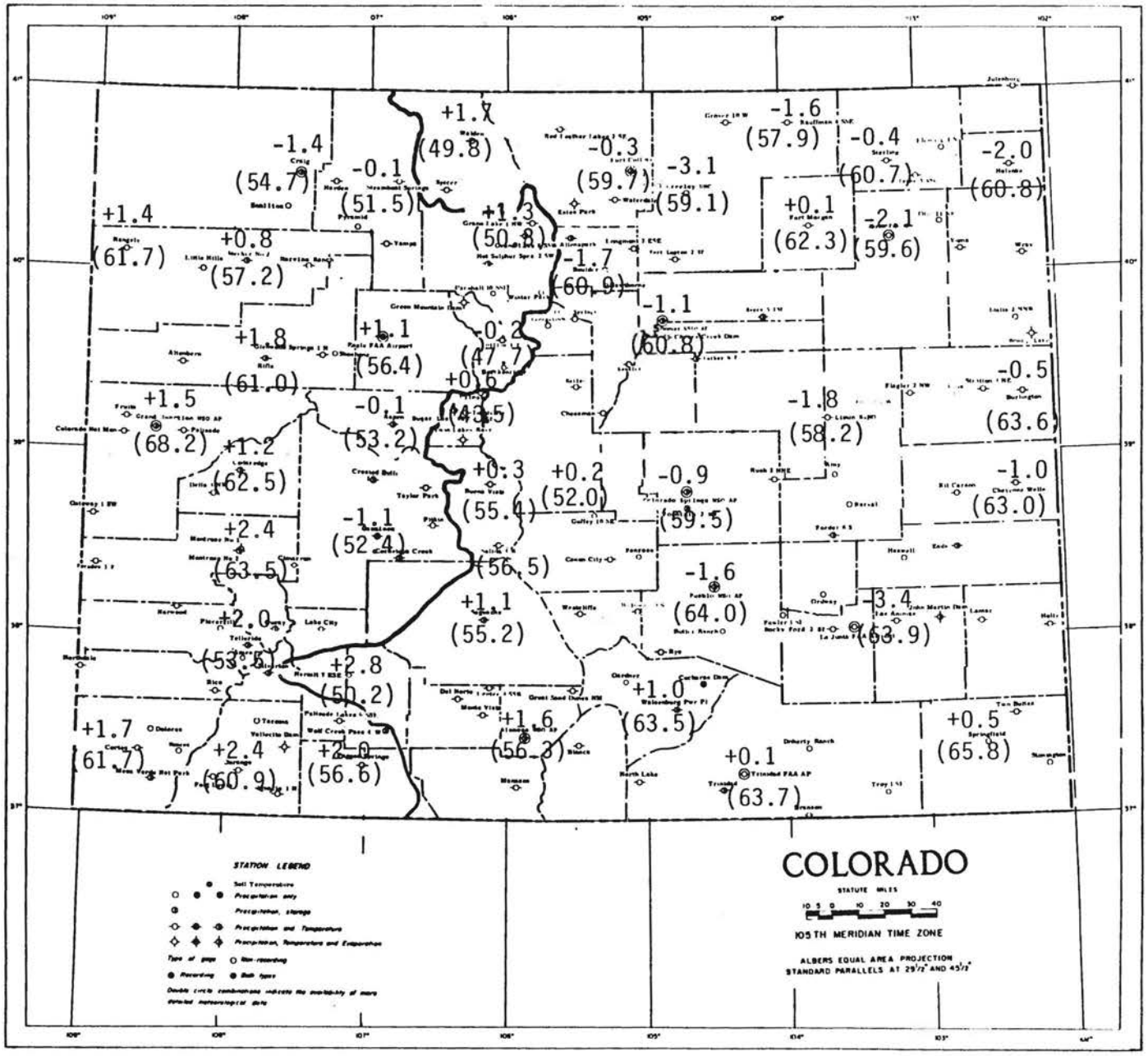

Figure 6. September 1984 growing degree days and growing season total (May 1 - September 30).

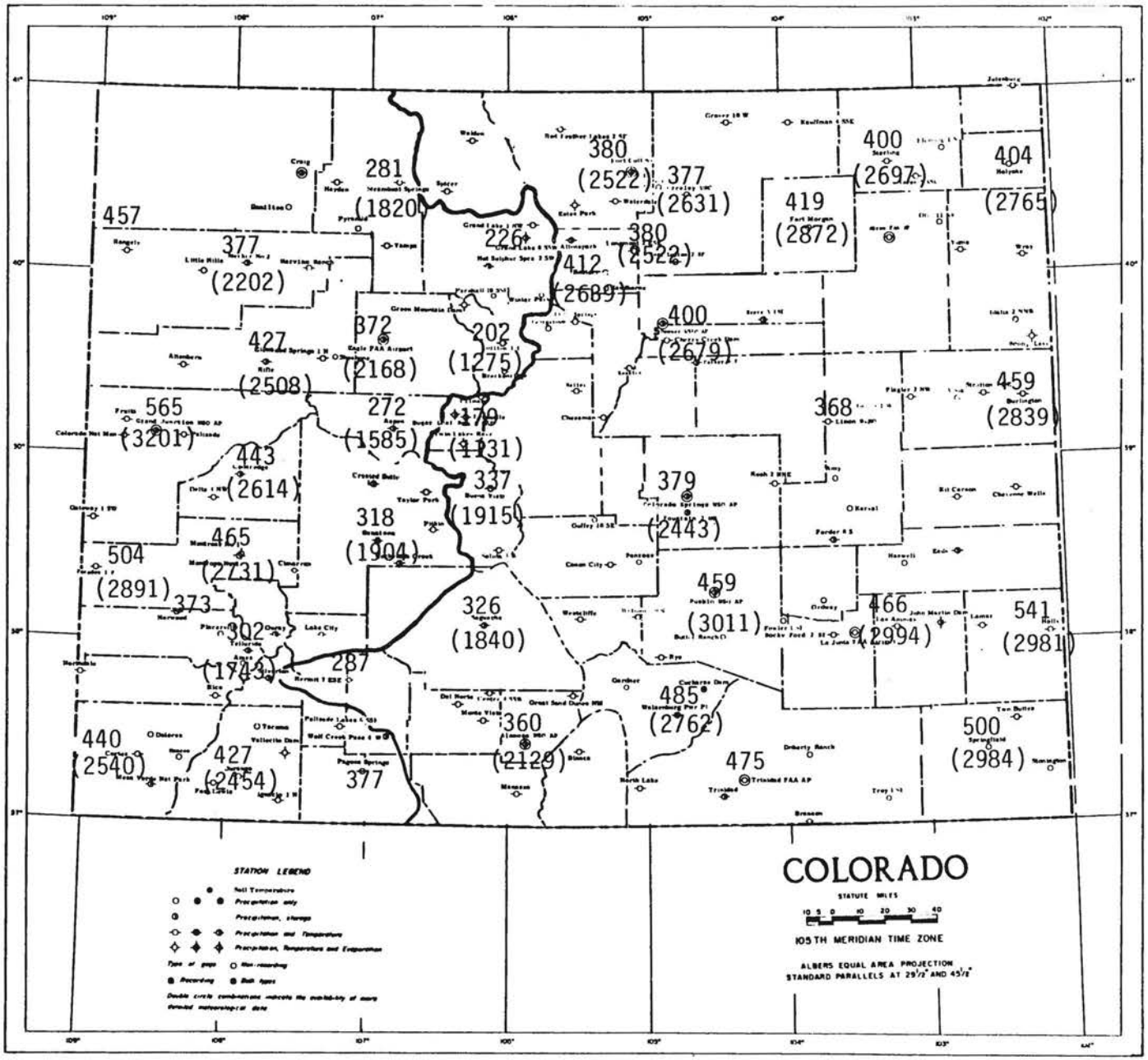

Table 1. Colorado Heating Degree Day Data through September 1984.

HEATING DEGREE DATA

STATION		JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	ANN
ALAMOSA	AVE	40	100	303	657	1074	1457	1519	1182	1035	732	453	165	8717
	83-84	28	35	213	674	1112	1581	1982	1566	1166	799	300	188	9644
	84-85	11	56	252										319
ASPEN	AVE	95	150	348	651	1029	1339	1376	1162	1116	798	524	262	8850
	83-84	97	86	269	622	1021	1392	1470	1200	1108	932	477	345	9019
	84-85	87	134	345										566
BOULDER	AVE	0	6	130	357	714	908	1004	804	775	483	220	59	5460
	83-84	4	0	84	350	753	1367	1087	830	792	639	168	58	6132
	84-85	0	1	171										172
BUENA VISTA	AVE	47	116	285	577	936	1184	1218	1025	983	720	459	184	7734
	83-84	45	49	234	595	970	1333	1331	1020	982	808	370	203	7940
	84-85	16	91	284										391
BURLING-TON	AVE	6	5	108	364	762	1017	1110	871	803	459	200	38	5743
	83-84	0	0	87	359	758	1500	1172	884	883	700	200	34	6577
	84-85	0	0	148										148
CANON CITY	AVE	0	9	81	301	639	831	911	734	707	411	179	33	4836
	83-84	0	0	71	314	649	1278	993	760	752	570	134	27	5548
	84-85	0	0											0
COLORADO SPRINGS	AVE	8	25	162	440	819	1042	1122	910	880	564	296	78	6346
	83-84	2	0	101	417	811	1438	1197	911	912	700	220	58	6767
	84-85	0	6	200										206
CORTEZ	AVE	0	11	115	434	813	1132	1181	921	828	555	292	68	6350
	83-84	5	0	98	438	854	1154	1271	1018		677	239	119	5873
	84-85	0	0	108										108
CRAIG	AVE	32	58	275	608	996	1342	1479	1193	1094	687	419	193	8376
	83-84	41	3	212	579	1005	1471	1730	1420	1194	884	383	267	9189
	84-85	15	25	304										344
DELTA	AVE	0	0	94	394	813	1135	1197	890	753	429	167	31	5903
	83-84	0	0	60	340	727	1061	1366	1006	736	505	135		5936
	84-85	0	11	49										60
DENVER	AVE	0	0	135	414	789	1004	1101	879	837	528	253	74	6014
	83-84	3	0	87	372	833	1466	1162	889	854	673	183	51	6573
	84-85	0	1	183										184
DILLON	AVE	273	332	513	806	1167	1435	1516	1305	1296	972	704	435	10754
	83-84	263	224	438	789	1135	1492	1653	1419	1333	1124	675	472	11017
	84-85	245	301	510										1056
DURANGO	AVE	9	34	193	493	837	1153	1218	958	862	600	366	125	6848
	83-84	3	0	124	464	899	1161	1289	1009	835	665	209	113	6771
	84-85	0	6	124										130
EAGLE	AVE	33	80	288	626	1026	1407	1448	1148	1014	705	431	171	8377
	83-84	30	3	203	579	962	1337	1681	1299	1015	798	338	238	8483
	84-85	1	27	252										280
EVER-GREEN	AVE	59	113	327	621	916	1135	1199	1011	1009	730	489	218	7827
	83-84	72	15	228	605	971	1449	1239	1040	1051	864	375	231	8140
	84-85	21	68											89
FORT COLLINS	AVE	5	11	171	468	846	1073	1181	930	877	558	281	82	6483
	83-84	2	0	115	415	843	1432	1225	887	829	661	196	81	6686
	84-85	0	0	193										193
FORT MORGAN	AVE	0	6	140	438	867	1156	1283	969	874	516	224	47	6520
	83-84	0	0	77	368	782	1614	1493	998	844	650	158	38	7022
	84-85	0	0	185										185
GRAND JUNCTION	AVE	0	0	65	325	762	1138	1225	882	716	403	148	19	5683
	83-84	0	0	27	208	678	1066	1366	958	630	474	89	44	5540
	84-85	0	0	54										54

HEATING DEGREE DATA

STATION		JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	ANN
GRAND LAKE	AVE	214	264	468	775	1128	1473	1593	1369	1318	951	654	384	10591
	83-84	233	156	400	703	1052	1436	1743	1486	1301	1120	630	411	10671
	84-85	155	213	435										803
GREELEY	AVE	0	0	149	450	861	1128	1240	946	856	522	238	52	6442
	83-84	3	0	72	375	843	1507	1344	955	848	661	170	49	6827
	84-85	0	0	213										213
GUNNISON	AVE	111	188	393	719	1119	1590	1714	1422	1231	816	543	276	10122
	83-84	75	60	299	641	1128	1486	2112	1752	1435	986	432	307	10713
	84-85	64	143	372										579
LAS ANIMAS	AVE	0	0	45	296	729	998	1101	820	698	348	102	9	5146
	83-84	0	0	25	222	682	1357	1246	826	761	502	98	3	5722
	84-85	0	0	132										132
LEAD-VILLE	AVE	272	337	522	817	1173	1435	1473	1318	1320	1038	726	439	10870
	83-84	308	316	488	832	1189	1529	1594	1389	1327	1171	702	515	11360
	84-85	308	366	536										1210
LIMON	AVE	8	6	144	448	834	1070	1156	960	936	570	299	100	6531
	83-84	7	0	109	442	874	1491	1334	1057	986	743	282		7325
	84-85	1	1	230										232
LONGMONT	AVE	0	6	162	453	843	1082	1194	938	874	546	256	78	6432
	83-84	1	0	91	382	849	1500	1357	915	868	688	197	54	6902
	84-85	0	3	237										240
MEEKER	AVE	28	56	261	564	927	1240	1345	1086	998	651	394	164	7714
	83-84	12	2	145	512	897	1298	1571	1217	1006	781	311	204	7956
	84-85	1	17	228										246
MONTROSE	AVE	0	10	135	437	837	1159	1218	941	818	522	254	69	6400
	83-84	0	0	73	390	833	1147	1332	1049	848	598	153	86	6509
	84-85	0	8	102										110
PAGOSA SPRINGS	AVE	82	113	297	608	981	1305	1380	1123	1026	732	487	233	8367
	83-84	51	10	190	566	977	1306	1524	1219	986	768	366	220	8183
	84-85	4		245										249
PUEBLO	AVE	0	0	89	346	744	998	1091	834	756	421	163	23	5465
	83-84	0	0	52	330	689	1375	1183	834	765	507	120	2	5857
	84-85	0	0	127										127
RIFLE	AVE	6	24	177	499	876	1249	1321	1002	856	555	298	82	6945
	83-84	3	0	86	430	835	1249	1445	1094	824	639	198	110	6913
	84-85	0	1	131										132
STEAMBOAT SPRINGS	AVE	113	169	390	704	1101	1476	1541	1277	1184	810	533	297	9595
	83-84	120	61	334	663	1071	1463	1725	1400	1162	957	490	339	9785
	84-85	82	103	397										582
STERLING	AVE	0	6	157	462	876	1163	1274	966	896	528	235	51	6614
	83-84	1	0	98	392	801	1637	1412	973	871	699	216	62	7162
	84-85	0	0	189										189
TELLURIDE	AVE	163	223	396	676	1026	1293	1339	1151	1141	849	589	318	9164
	83-84	108	130	288	597	1012	1261	1383	1154	1092	900	433	331	8689
	84-85	99	165	337										601
TRINIDAD	AVE	0	0	86	359	738	973	1051	846	781	468	207	35	5544
	83-84	0	0	55	291	698	1368	1111	834	828	548	139	20	5892
	84-85	0	0	138										138
WALDEN	AVE	198	285	501	822	1170	1457	1535	1313	1277	915	642	351	10466
	83-84	156	114	387	759	1120	1534	1643	1417	1240	1090	579	386	10425
	84-85	122	184	448										754
WALSEN-BURG	AVE	0	8	102	370	720	924	989	820	781	501	240	49	5504
	83-84	0	C	87	310	683	1248	1001	801	789	552	147	32	5650
	84-85	0	0	113										113