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COLORADO CLIMATE SUMMARY

WATER-YEAR SERIES

(October 1982 - September 1983)

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Nolan J. Doesken

Thomas B. McKee



Climatology Report No. 84-1

**DEPARTMENT OF ATMOSPHERIC SCIENCE
COLORADO STATE UNIVERSITY
FORT COLLINS, COLORADO**

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WATER-YEAR SERIES
(October 1982 - September 1983)

by
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I. INTRODUCTION

This report is the sixth in an ongoing series of water-year climate summaries prepared by the Colorado Climate Center. This annual summary is simply a collection of twelve monthly summaries with some 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 has also been developed and expanded.

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 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 introduction to 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.

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.

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. Snowpack data collected by the U.S. Department of Agriculture Soil Conservation

Service are added during winter and early spring to provide some information for the data-sparse mountainous areas.

The averages which are used in this report for both temperature and precipitation were calculated using 1961-1980 data. Heating degree day normals were based on 1941-1970 data. Cooling degree days for the entire summer and heating degree days beginning in July were compared to the new 1951-1980 normals.

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 winter, maps are shown which contain heating degree days and the departure from average and heating degree days compared with the previous year. A table of heating degree day information is presented each month. During the summer months, tables of cooling degree days are given. 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.

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 it 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. 1983 WATER YEAR IN REVIEW

Temperatures for the 1983 water year ended up close to average over most of Colorado. Unusually warm midwinter and late summer temperatures offset the cold autumn and spring conditions. At the same time total precipitation was well above average over the majority of the State. Portions of west central Colorado and a few areas near the Front Range received 50% more precipitation than normal.

The year got off to a cool start. Most of the state was dry in October but the northwestern valleys, the Denver area, and the extreme southeastern plains were unusually wet.

Cooler than average temperatures persisted into November. In the mountains, winter weather set in by mid November -- in time for the traditional beginning of the winter ski season. Most mountain areas received plenty of November snow, especially the San Juans. But east of the mountains precipitation was sparse with some locations on the southeast plains reporting no precipitation at all.

December began very uneventfully. Not much precipitation fell anywhere in Colorado prior to December 23. Very warm temperatures in mid month made the idea of a White Christmas seem like a distant dream for the lower elevations and Front Range. But a huge storm, which first pounded California enroute to Colorado, changed everything. The storm of Christmas Eve Day was predicted well in advance by the National Weather Service. Even so, the storm hit Denver and parts of northeastern Colorado with such fury that it will stay fresh in people's memories for a long time. Two to three feet of snow blown by 30-40 mph winds fell in just 24 hours over much of the Denver metropolitan area

totally immobilizing the city. Cold weather followed the storm which did nothing to help the snow removal operations.

Placid weather returned in January with unusually and consistently above average temperatures over most of Colorado. No precipitation fell over most of the northeastern plains and all the mountains were much drier than usual. Southeastern Colorado managed to pick up some decent precipitation during the month with a foot or more of snow -- more than double the average for that part of the state.

Storminess increased during February producing unusually heavy precipitation in parts of southwestern and southeastern Colorado. But again the Front Range and northeastern plains remained very dry. Temperatures continued unusually warm as Colorado avoided the normal winter polar outbreaks which typically bring a period or two of subzero temperatures to most of the state.

March saw an abrupt change to wet weather which marked the beginning of a very unusual spring. A series of major storms produced very heavy precipitation. Several new monthly records were set such as Denver's 4.56" total (30.5" snow). Warm weather early in the month gave way to a cold second half, and this cold cycle continued right into April.

As a result of colder than average April temperatures and bountiful late season snowfall, mountain snowpack continued to increase. Berthoud Pass received 93" of snow in April (7.42" water equivalent). Above average precipitation and snowfall also occurred over most of the Eastern Plains making this one of the coldest and wettest springs in many years.

The calendar said it was May but cold weather with snow continued in the mountains and across portions of eastern Colorado. Storms in mid May added to the mountain snowpack and spread rain across the lower elevations and several inches of heavy wet snow along the eastern foothills. A surprise late season blizzard on May 17 knocked out power in several Front Range communities when 70 mph winds accompanied heavy wet snow. At last, warm weather arrived near the end of May. Temperatures soared into the 80s and rivers instantly responded by rapidly rising to near flood stage. Despite this melting, measurements taken at the end of the month showed many areas in the Colorado high country had actually experienced an increase in snowpack through the month. This set the stage for the widespread flooding which occurred in June.

June is normally the driest month of the year for the mountains, but in keeping with the unusual nature of this year, rains and even some high elevation snows continued to pour down and temperatures lagged below average. A true summer heatwave later in the month, followed by one more round of widespread moderate to heavy rainfall, sent rivers out of their banks in many parts of the state. June streamflows were the greatest on record at several locations both east and west of the Continental Divide. Severe thunderstorms also left their mark on Colorado in June. Greeley was clobbered by a terrible hailstorm which caused nearly 30 million dollars damage to the community on June 4.

July brought with it a return to more normal conditions, although rivers continued to flow at much higher than average rates. Precipitation was extremely variable. A few areas of western Colorado had their wettest July on record while southeastern Colorado was very

dry. In July at lower elevations, high temperatures and humidities reminiscent of typical Midwestern summers set in and continued through August. It was one of the hottest Augusts on record across Colorado with several stations breaking records which had stood since the Dust Bowl years. With the high humidity over the state, many heavy thunderstorms developed and some record precipitation amounts were measured such as the 6.68" monthly total at Berthoud Pass. Again, southeast Colorado remained very dry.

The water year ended on a dry note as sunny and warm weather dominated the state in September. It could have been another record warm month except for a brief but severe shot of cold air which hit the entire state from September 19-22. Temperatures slid well below freezing over nearly the entire state bringing an early end to the growing season and reducing crop yields in some areas.

In summary, the 1983 water year was a year of abundant moisture. While the summer was dry over much of the Eastern Plains, particularly the southeast, spring moisture was plentiful. The result was all time record wheat yields across the plains. Other crops were slowed by the cold, damp spring but recovered nicely with the summer heat and unusually high humidity. Yields of many other crops such as corn, vegetables and sugar beets would have been excellent were it not for the destructive mid-September freeze. Hot and dry weather during later summer seriously depleted soil moisture in parts of eastern Colorado and the 1984 winter wheat crop got off to only a fair start in those areas.

The number one weather story during the 1983 water year was the incredible spring-summer runoff and the flooding it produced. High water and saturated soils resulted in the demise of several stretches of

highway in the state. High water closed roads, and debris and river bank erosion caused trouble in many areas both east and west of the Continental Divide during May, June and July. Lingering snow and mud restricted access into the high country until fairly late in the summer. On the positive side, very few forest fires occurred during the year and fire damage was minimal.

With the abundant precipitation and runoff, surface water supplies were excellent throughout the year with plenty of water available for urban and industrial use as well as agriculture. Reservoir storage was above average at the beginning of the year and was even farther above average as the water year ended. On September 30, 1983, major reservoirs across the state held an average of nearly 60% more water than they normally do at the end of the irrigation season.

Colorado's tourism trade fared well during the 1983 water year. Good early and late winter snows meant a long and profitable ski season for the major resorts even though midwinter was quite dry. Summer was slowed by the national media attention given to the mountain states flooding, but hot late summer weather across much of the country sent people scurrying to the cool mountains.

Summer thunderstorms were unusually severe in the mountains. The central mountains experienced some of the liveliest lightning activity in memory and localized flash flooding occurred on several occasions. However, on the plains the spring and summer severe weather season was relatively placid. The worst set of storms were those in early June which bombarded Greeley and other parts of northeastern Colorado with damaging hail and a few small tornadoes.

Wind damage during the year was minor. Compared to the 1982 season, there were very few damaging wind storms and very few of the severe downslope wind events to which the Front Range is susceptible. The worst widespread winds of the year accompanied the Christmas Eve Day blizzard and the freak May 17 snowstorm.

With the obvious exception of the December 24 snowstorm, snow removal was not much of a problem during the 1983 water year. Most of the season's snowfall over the state fell in March and April when warmer days and strong sunshine assisted in clearing streets. But those areas hardest hit by the Christmas Eve blizzard had little to be thankful for. Due to the storms timing, intensity and strong winds, and the fact that it chose the Denver metropolitan areas as its main target, it can be ranked as the worst snow removal nightmare in Colorado's modern history.

Energy consumption for space heating (estimated from heating degree days) increased for the second year in a row. Winter season heating degree day totals were close to average over most of the state but were typically about 4 to 8% higher than they were a year ago. The impact of this increase was not dramatic, however, since much of this increase was spread among several autumn and spring months. Midwinter energy consumption for heating purposes was actually less than average.

COLORADO CLIMATE -- OCTOBER 1982

Colorado Climate Center
Department of Atmospheric Science
Colorado State University

October marked the beginning of the new 1983 water year, the 12-month period which corresponds well with Colorado's water storage -- water usage cycle. The month was characterized by below average temperature state-wide and generally light but extremely variable precipitation.

Significant Highlights -- October

<u>Date</u>	<u>Event</u>
1-2	Remains of Pacific storm system crossed the state. Cool temperatures with some rain. Some heavy amounts extreme southeast early on 1st. Stonington, 1.35".
3-5	Dry 3rd and 4th and much warmer. Warmest temperatures of the month most areas. Climax 55°F, Alamosa 74°F, Sterling 83°F on the 4th. Pueblo 86°F and Las Animas 90°F (warmest in the state) on the 5th.
5-6	Fast moving storm system crossed the state. Scattered rain with high elevation snows late on the 5th mostly in the Northern and Central mountains. Cooler.
7-13	Strong low pressure area developed rapidly over Colorado 7th and 8th and moved slowly northeast. Much warmer across the Plains on the 7th (Denver 80°F, Limon 81°F, Holly 89°F). Then, very windy and much colder 8-9. Local heavy storm dropped 2.65" of rain at Stonington on the 8th. Some precipitation across most of the northern two-thirds of state with snow in many areas. Heaviest precipitation in the mountains and on the Palmer Ridge south and east of Denver. Parker, 4" snow on 8th. <u>Cold</u> with mountain snow showers 10-13th. Fort Collins 20°F reading morning of 10th set a new record. Climax, -4°F.
14-18	Sunny with seasonal temperatures west, warmer than average east.
19-20	Brief snow across northern part of state early on the 19th, mostly light, as cold front and upper air disturbance crossed the state. Then clearing and cool. Burlington 20°F on the 20th.
21-24	Large high pressure area dominated the country. Mostly clear and mild. Lovely autumn weather.

<u>Date</u>	<u>Event</u>
25-27	Warm weather continued as major Pacific storm system moved into the Rockies. Plains remained dry but mountains and western valleys received significant precipitation. One to two inches of rainfall common in areas of west central Colorado. Uravan 1.30", Paonia 1.48", Redstone 2.02". Wolf Creek Pass picked up a quick 2.50" of precipitation including 13 inches of snow.
28-30	Cold nighttime temperatures occurred after the storm including a 7° reading at Dillon, -2° at Taylor Park Dam, and -8° at Platoro Dam on the morning of the 29th, the coldest in the state. Some lingering mountain snowshowers.
31	Warmer with precipitation spreading into the state again as an upper air disturbance approached the state.

Precipitation Summary

Precipitation totals and percents of average for October are shown in Figures 1 and 2. Most areas east of the Continental Divide, the San Juan Mountains and the upper Gunnison and upper Colorado river basins were drier than average. Saguache, in the San Luis Valley, received just a trace of precipitation in October. Some exceptions to this dry pattern were noted, however. Monthly totals were substantially above average along the base of the foothills south from Boulder to the Palmer Ridge as a result of the October 8th storm. Heavy precipitation amounts were also noted in extreme southeast Colorado. Stonington's 4.19 inch total was 582 percent of average.

Above average precipitation occurred over most of central and northwestern Colorado. Totals from Delta northward to Craig were generally about 40 percent above average. Wolf Creek Pass's 4.70 inch total for the month was the greatest in the state followed by 3.72 inches at Marvine Ranch (east of Meeker).

Temperature Summary

The entire state was cooler than average (Figure 3) in October. Most stations east of the Divide ended up about 2 degrees Fahrenheit below average. Even cooler conditions were observed west of the Divide where most locations averaged 3 to 5 degrees colder than usual. The Central Mountain area was particularly chilly. Leadville, Climax,

Dillon, and Aspen all were 5 to 6 degrees colder than average for the month, the coldest October since 1970.

Degree Days

From now through April an expanded discussion of heating degree days will be included.

Heating degree day totals in October were above average and above October 1981 across practically all of the state (see Table 1, Figure 4 and Figure 5). This means greater energy demand for space heating than last year or what would normally be expected, all other conditions remaining equal. Heating degree days this October compared to last year ranged from 10 percent fewer at Grand Junction and about the same at Boulder to more than 20 percent more at Denver, Delta, Cortez, Colorado Springs, Pueblo, and Walsenburg.

Figure 1. October 1982 precipitation amounts (inches).

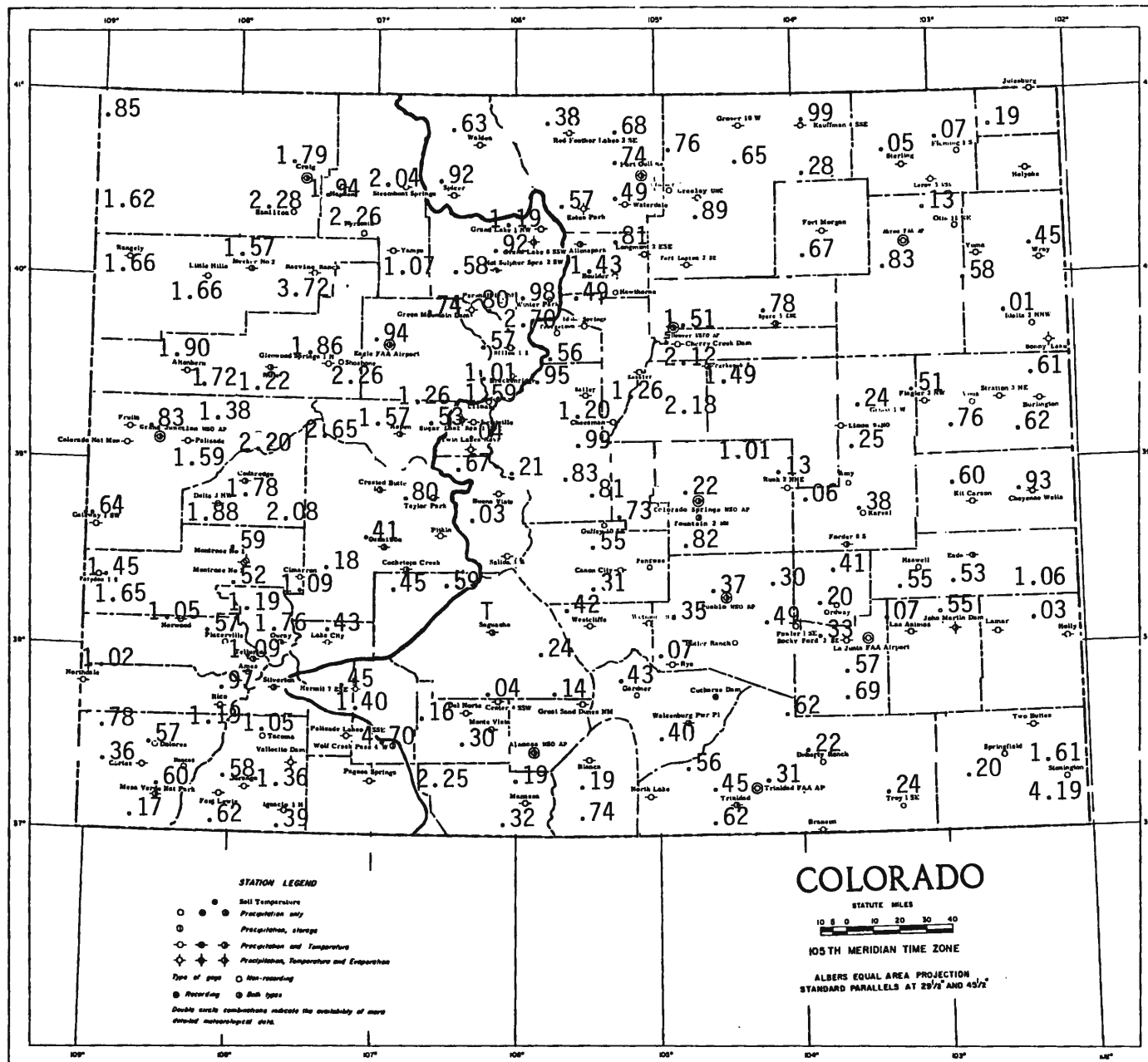


Figure 2. Precipitation for October 1982 as a percent of the 1961-1980 average.

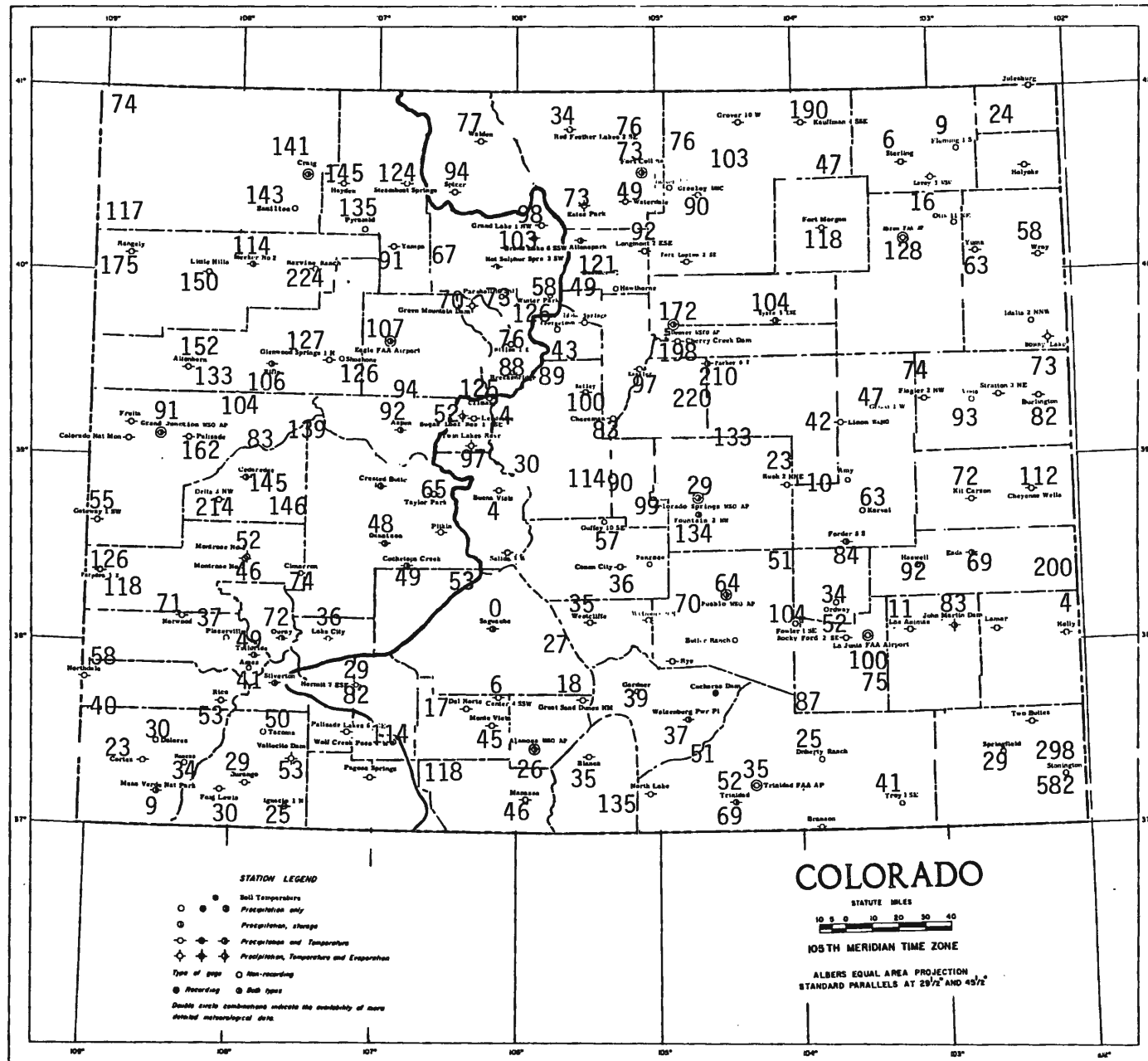


Figure 3. Temperatures for October 1982 in degrees Fahrenheit (in parentheses) and the departure from the 1961-1980 average.

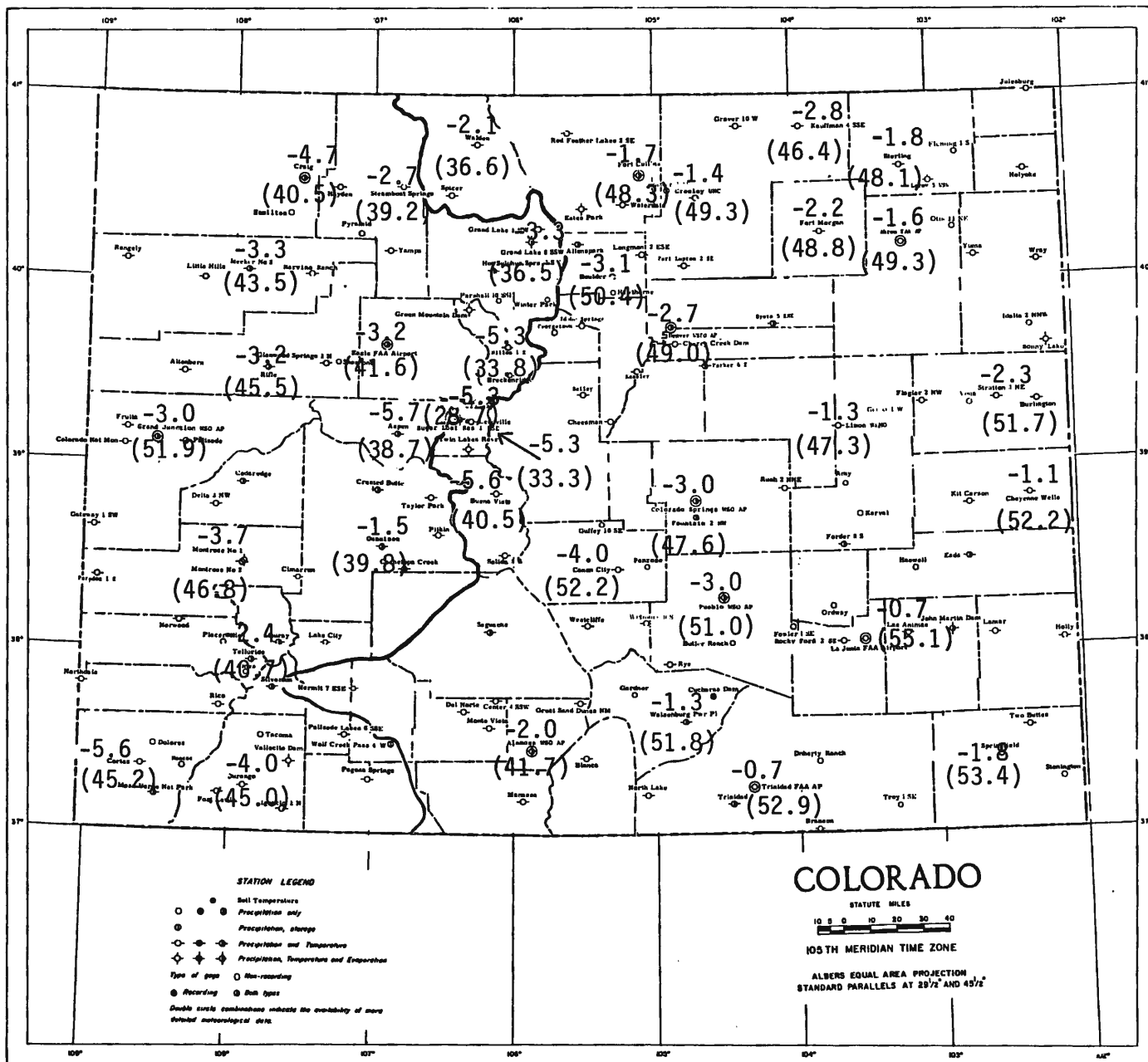


Figure 5. October 1982 Heating Degree Days as a percent above or below October 1981.

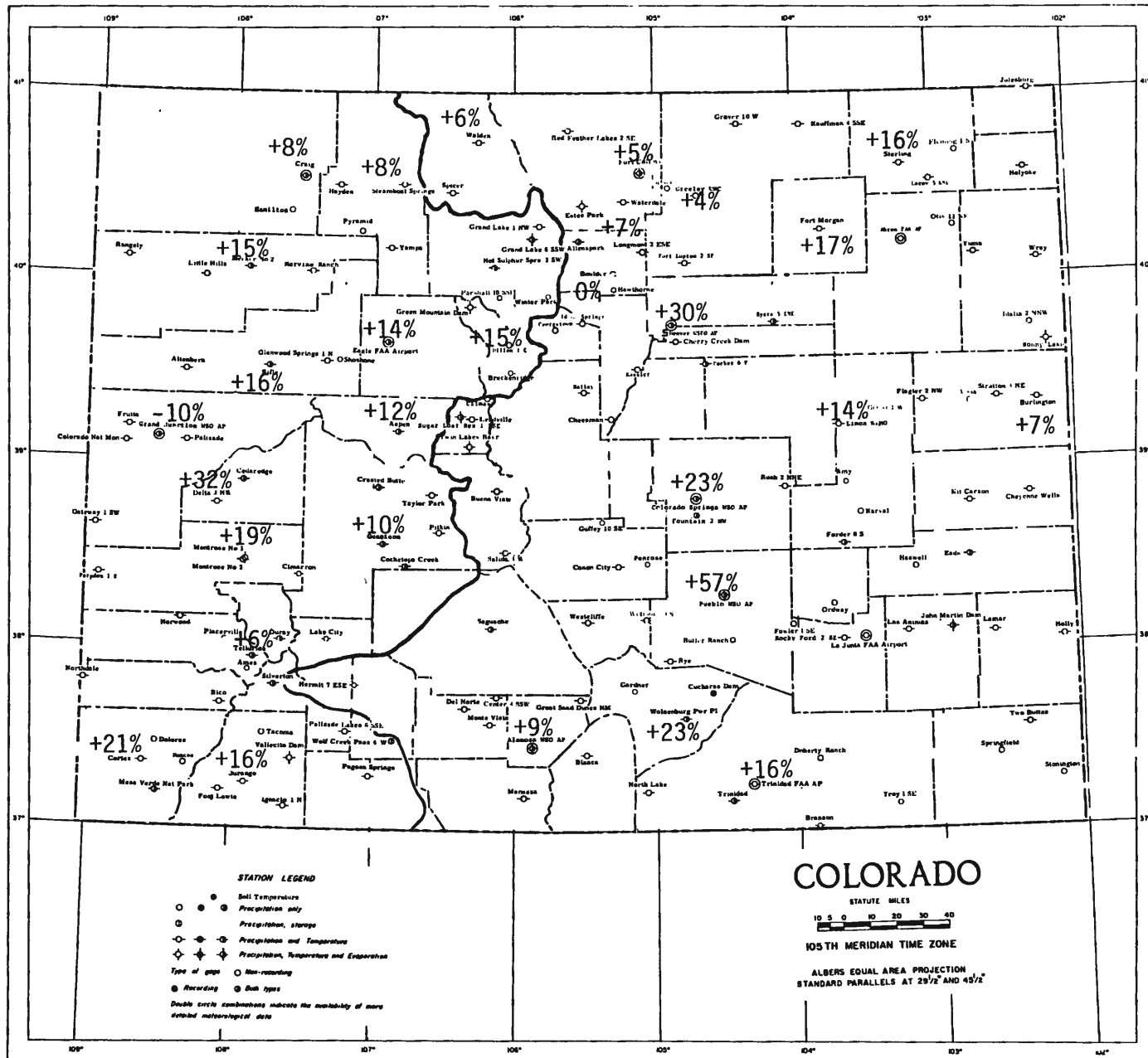


Table 1. Colorado Heating Degree Day Data through October 1982.

		JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	ANNUAL		JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	ANNUAL	
Alamosa	average	55	96	294	648	1053	1420	1482	1182	1054	714	440	171	8609	Greeley	average	0	5	153	465	870	1147	1256	991	911	528	253	60	6639
	1981-82	14	108	254	656	904	1366	1457	1192	977	736	508	230	8402		1981-82	5	9	31	459	651	1014	1170	942	721	511	275	82	5870
	1982-83	59	47	274	714											1982-83	5	0	154	478									
Aspen	average	113	161	345	654	1026	1324	1392	1176	1144	792	530	291	8948	Gunnison	average	103	169	384	704	1110	1538	1686	1397	1246	789	533	282	9941
	1981-82	98	147	298	721	916	1279	1408	1190	1079	897	609	366	9008		1981-82	63	165	328	709	977	1354	1693	1517	1093	786	564	379	9628
	1982-83	148	119	362	808											1982-83	132	89	374	778									
Boulder	average	6	0	139	367	690	905	992	826	809	482	236	88	5540	Lamar	average	0	0	57	320	741	1032	1107	854	766	377	129	19	5402
	1981-82	4	14	36	444	562	866	964	818	649	440	279	107	5183		1981-82	0	0	27	287	575	963	1076	988	615	364	117	22	5034
	1982-83	4	0	154	442											1982-83	0	0	41										
Burlington	average	0	0	102	363	741	1011	1085	882	828	462	210	54	5738	Limon	average	8	6	144	448	834	1070	1156	960	936	570	299	100	6531
	1981-82	10	7	25	377	601	940	1155	990	727	499	213	78	5622		1981-82	6	26	83	516	704	1071	1244	1066	850	660	363	176	6765
	1982-83	0	5	99	405											1982-83	18	5	184	539									
Canon City	average	0	0	57	285	600	806	877	728	713	402	158	34	4660	Longmont	average	0	7	155	457	828	1076	1184	952	902	537	269	92	6459
	1981-82	2	9	35	495	761						253	84	---		1981-82	5	12	38	481	652	979	1156	952	730	485	280	98	5868
	1982-83	3	6	109	391											1982-83	7	0	164	517									
Colorado Springs	average	9	13	155	456	825	1054	1128	944	921	564	301	103	6473	Meeker	average	28	56	261	564	927	1240	1345	1086	998	651	394	164	7714
	1981-82	5	30	70	433	640	993	1095	1001	827	571	374	163	6202		1981-82	8	72	160	572	847	1098	1254	1080	884	731	442	207	7355
	1982-83	8	11	198	532											1982-83	33	7	245	657									
Cortez	average	0	10	110	425	807	1104	1156	904	834	534	274	81	6239	Montrose	average	0	9	129	435	828	1132	1197	935	834	510	245	71	6325
	1981-82	2	7	83	499	726	1076	1230	1037	825	609	362	109	6565		1981-82	0	8	38	466	714	1074	1185	976	727	525	262	47	6022
	1982-83	17	5	132	606											1982-83	4	2	111	556									
Craig	average	32	58	275	608	996	1342	1479	1193	1094	687	419	193	8376	Pagosa Springs	average	95	114	291	611	981	1311	1401	1140	1048	711	481	233	8417
	1981-82	19	35	149	697	901	1260	1529	1277	987	838	506	209	8407		1981-82	19	102	244	642	856	1265	1525	1197	1006	708	495	269	8328
	1982-83	37	5	271	752											1982-83	76	29	253										
Delta	average	0	0	94	394	813	1135	1197	890	753	429	167	31	5903	Pueblo	average	0	0	55	335	726	992	1082	848	775	405	148	28	5394
	1981-82	0	1	17	375	673	966	1123	894	625	451	163	12	5300		1981-82	0	0	22	272	554	937	1046	882	582	358	151	21	4825
	1982-83	2	4	81	496											1982-83	0	0	63	427									
Denver	average	0	0	120	408	768	1004	1088	902	868	525	253	80	6016	Rifle	average	7	22	167	481	861	1200	1296	997	859	537	283	85	5394
	1981-82	0	12	19	375	570	898	1070	918	733	522	306	92	5515		1981-82	0	4	513	760	1173	1342	1056	774	603	323	105	---	
	1982-83	3	0	151	487											1982-83	8	3	150	596									
Dillon	average	291	341	519	809	1173	1442	1519	1319	1321	966	701	453	10854	Salida	average	28	69	240	536	854	1094	1132	958	905	588	369	139	6910
	1981-82	243	302	448	835	1027	1379	1520	1323	1238	1058	746	507	10626		1981-82	22	67	168	537	1033	1179	1096	---	---	---	---	---	---
	1982-83	318	253	511	959											1982-83	---	---	---	---									
Durango	average	20	37	198	502	843	1147	1212	958	880	597	375	161	6930	Steamboat Springs	average	116	159	384	691	1086	1451	1553	1277	1190	789	521	306	9523
	1981-82	9	22	125	531	764	1047	1311	1004	845	599	383	145	6785		1981-82	83	141	257	734	973	1340	1502	1361	1069	878	589	380	9307
	1982-83	24	6	175	614											1982-83	146	80	368	791									
Eagle	average	43	79	285	626	1023	1386	1457	1168	1051	693	425	190	8426	Sterling	average	0	6	158	459	849	1150	1249	986	927	522	256	76	6638
	1981-82	6	54	155	632	889	1244	1451	1206	904	753	479	234	8007		1981-82	8	20	79	448	755	1085	1321	1042	832	595	337	122	6644
	1982-83	54	21	257	720											1982-83	3	3	154	518									
Fort Collins	average	7	12	175	477	834	1076	1184	960	918	558	297	101	6599	Telluride	average	185	229	399	676	1017	1290	1333	1140	1147	825	583	345	9169
	1981-82	8	8	42	487	661	987	1142	926	741	527	295	115	5939		1981-82	117	177	320	707	891	1209	1323	1131	1062	815	582	325	8659
	1982-83	4	0	178	509											1982-83	139	140	364	746									
Fort Morgan	average	0	0	132	439	849	1141	1262	986	899	509	233	61	6511	Trinidad	average	0	0	81	364	732	980	1054	868	822	471	212	58	5642
	1981-82	3	11	37	421	650	1035	1199	981	742	516	234	81	5910		1981-82	0	15	39	316	524	849	935	897	624	428	211	49	4887
	1982-83	3	3	123	492											1982-83	0	0	66	367									
Grand Junction	average	0	0	60	324	756	1101	1190	879	738	404	133	20	5606	Walden	average	197	270	489	803	1149	1438	1538	1313	1280	891	626	363	10357
	1981-82	0	0	12	439	696	1039	1203	841	581	405	136	6	5358		1981-82	143	241	357	831	1007	1314	1444	1262	1114	958	703	412	9786
	1982-83	2	0	61	397											1982-83	201	141	469	878									
															Walsenburg	average	6	12	93	364	690	911	977	820	806	489	230	62	5460
														1981-82		0	15	41	324	522	831	932	853	671	474	250			

COLORADO CLIMATE -- NOVEMBER 1982

Colorado Climate Center
Department of Atmospheric Science
Colorado State University

Accumulation of high elevation snowpack was above average in most of the Colorado Rockies in November -- good news for skiers and water users. However, east of the mountains, precipitation was meager. Temperatures were mostly colder than average statewide.

Significant Highlights -- November

<u>Date</u>	<u>Event</u>
1-2	Turning colder. Scattered precipitation over the state, mostly light. Craig, .82" on 1st, mostly rain. Walsenburg, .45" on 2nd.
3-7	Dry period. Chilly 3-4, then much warmer. Alamosa, +3°F on 3rd. Warmest temperatures of the month over most of the state 6-7. 75°F on the 6th at Las Animas, John Martin Dam and near La Junta -- the warmest in the state.
8-9	Cold air slipped across the High Plains. Continued mild mountains and west as large storm system formed along the West Coast. Precipitation, some heavy, began in southwest Colorado on the 8th.
10-11	Storm system crossed state. Moderate to heavy precipitation mountains and western valleys. Well over an inch of precipitation in many areas since the 8th. Rain lower elevations with snow above. Wolf Creek Pass totalled 55" of snow for the storm (3.75" water equivalent). Precipitation east of the mountains was much lighter although some areas, Fort Morgan and Sedgwick for example, received more than 0.50".
12-14	Surge of very cold air dipped into Colorado accompanied by some scattered snowshowers. Durango, 13° on the 12th. Leadville, -12°F on 14th.
15-19	Warming trend. Dry east of mountains. Precipitation developed 18-19th over the mountains and western valleys. Vallecito Dam, .73" rain 18-19th. Very warm east of mountains -- 60's and a few 70's.
20-21	Unsettled period as strong westerly winds aloft produced periods of light snow in the mountains.

<u>Date</u>	<u>Event</u>
22-24	Polar outbreak brought dry powdery upslope snows along the Front Range 22-23rd -- 2-4 inches. Then clearing and very cold on the 24th. Coldest day so far this winter across northern 2/3 of the state. Nunn, -5°F. Steamboat Springs, -15°F. Walden, -20°F, coldest in the state.
25-28	Generally a dry period as slow moving storm system passed far south of Colorado.
29-30	Mild and dry east of mountains. Precipitation, heavy in the southwest, spread into the state. Durango received more than 2" of water equivalent (12.5" snow).

Precipitation Summary

Precipitation totals and percents of average for November are shown in Figures 1 and 2. Most areas along and west of the Continental Divide were near or above average. The Grand Mesa area and the southwestern slopes of the San Juan Mountains received about double their average November precipitation. Durango totalled 4.55" of precipitation for the month, 342% of average. Three small areas west of the Divide were drier than usual; the upper Gunnison basin, a small portion of the upper Colorado basin, and the immediate Grand Junction area.

Precipitation east of the Divide was scant, rather typical for mid-winter. Wooten Ranch (near Trinidad) and Sedgwick (in extreme northeast Colorado) were the only sites reporting more than an inch of precipitation. The Trinidad area and the northeastern plains indicated above average precipitation for the month. Otherwise, the remainder of eastern Colorado was drier than usual. Several stations in the Arkansas Valley reported no measurable precipitation.

Water-Year Precipitation to Date

Precipitation as a percent of average for the first two months of the 1983 water year is shown in Figure 3. Precipitation to date is near or above average in most of western Colorado with the exception of the Gunnison and Uncompahgre valleys. East of the Divide, most areas are drier than normal except for scattered points on the Eastern Plains and an area near Denver.

Despite the large areas with below average precipitation, the state's water supplies are in good shape for this time of year. Good soil moisture (except for the southeast), above average streamflows and reservoir storage, and a fine early season snowpack are all contributing to this optimistic outlook.

Temperature Summary

Most of the state experienced temperatures which were 1 to 4 degrees Fahrenheit colder than average for November as a whole (Figure 4). Temperatures along the New Mexico and Utah borders were close to average with both Alamosa and Grand Junction ending up one degree above their 1961-1980 November averages.

Heating Degree Days

Heating Degree Day totals, which correspond well to the amount of energy required to heat buildings, were near or above average across most of the state (Figure 5), reflecting the cold November temperatures. Totals ranged from 7% less than average at Grand Junction to 24% more than average at Canon City. As shown in Figure 6, heating degree day totals in November 1982 were considerably greater than the previous year. Many cities across the northeastern two-thirds of the state received 20% to 54% more degree days than a year ago. This corresponds directly to increased demand for fuel to heat homes, schools and businesses. Considering the utility rate increases which have occurred since last year, this translates into much higher utility bills for November for the average consumer.

Figure 1. November 1982 precipitation amounts (inches).

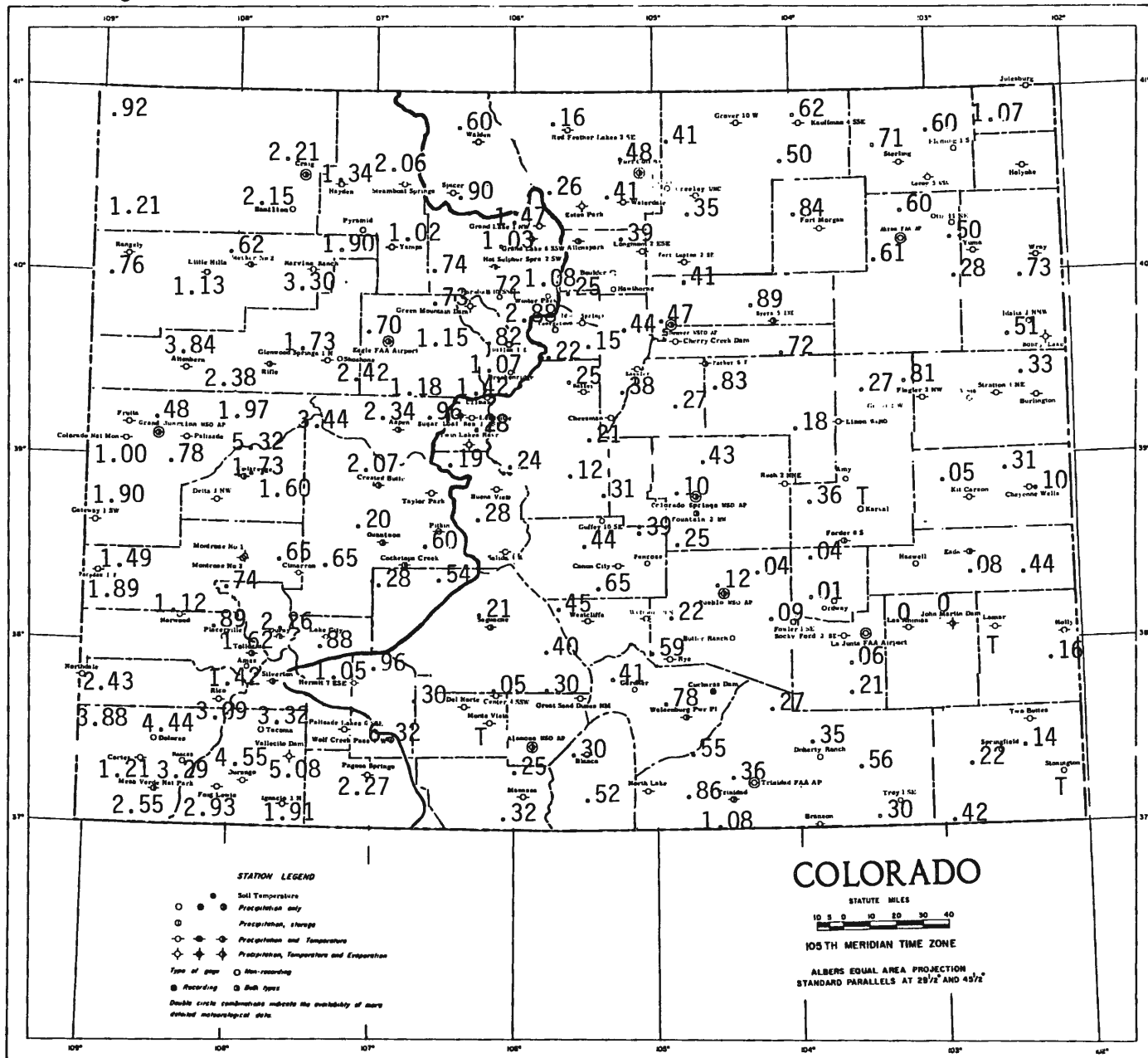


Figure 2. Precipitation for November 1982 as a percent of the 1961-1980 average.

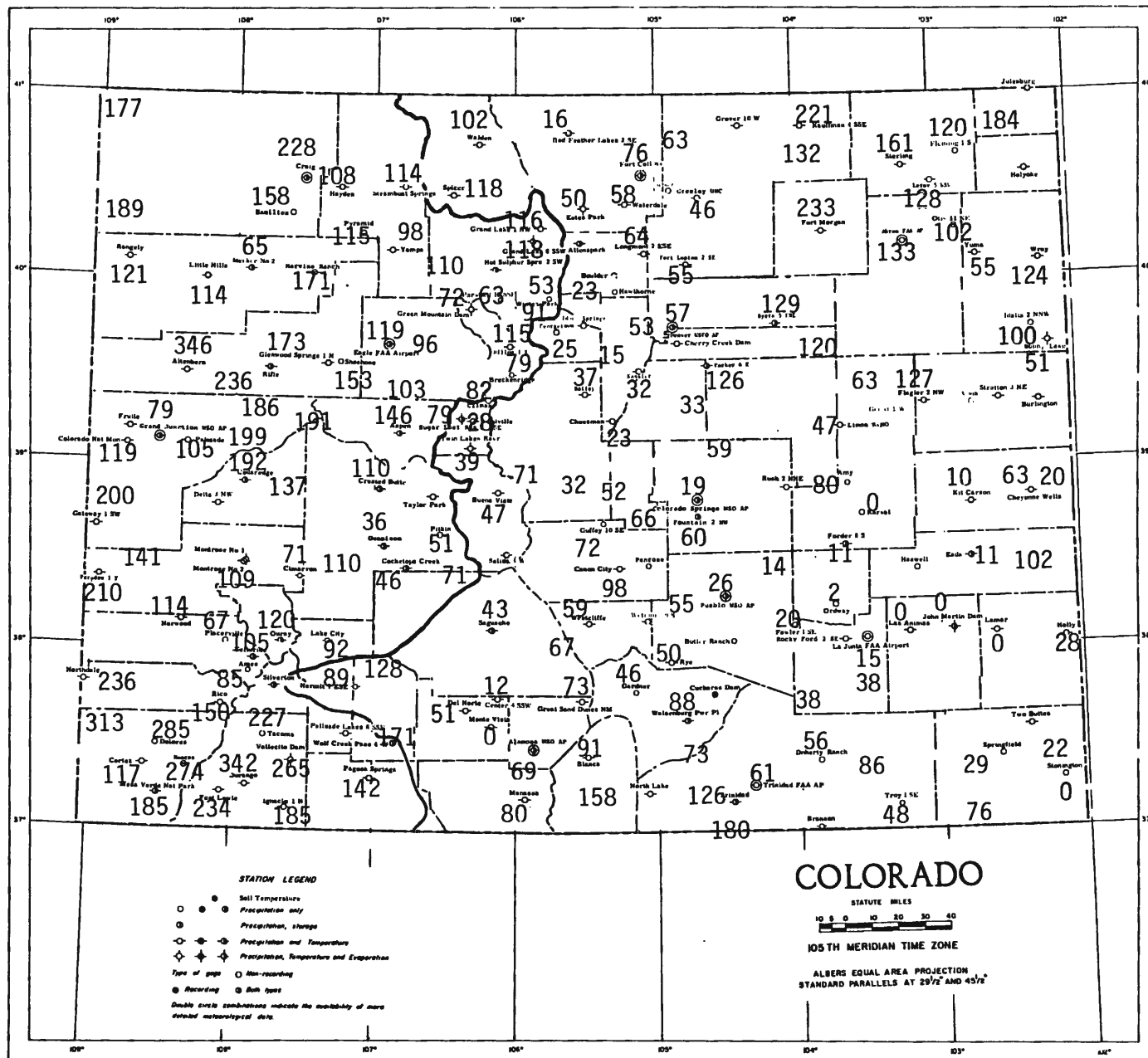


Figure 3. Precipitation for October 1982 through November 1982 as a percent of the 1961-1980 average.

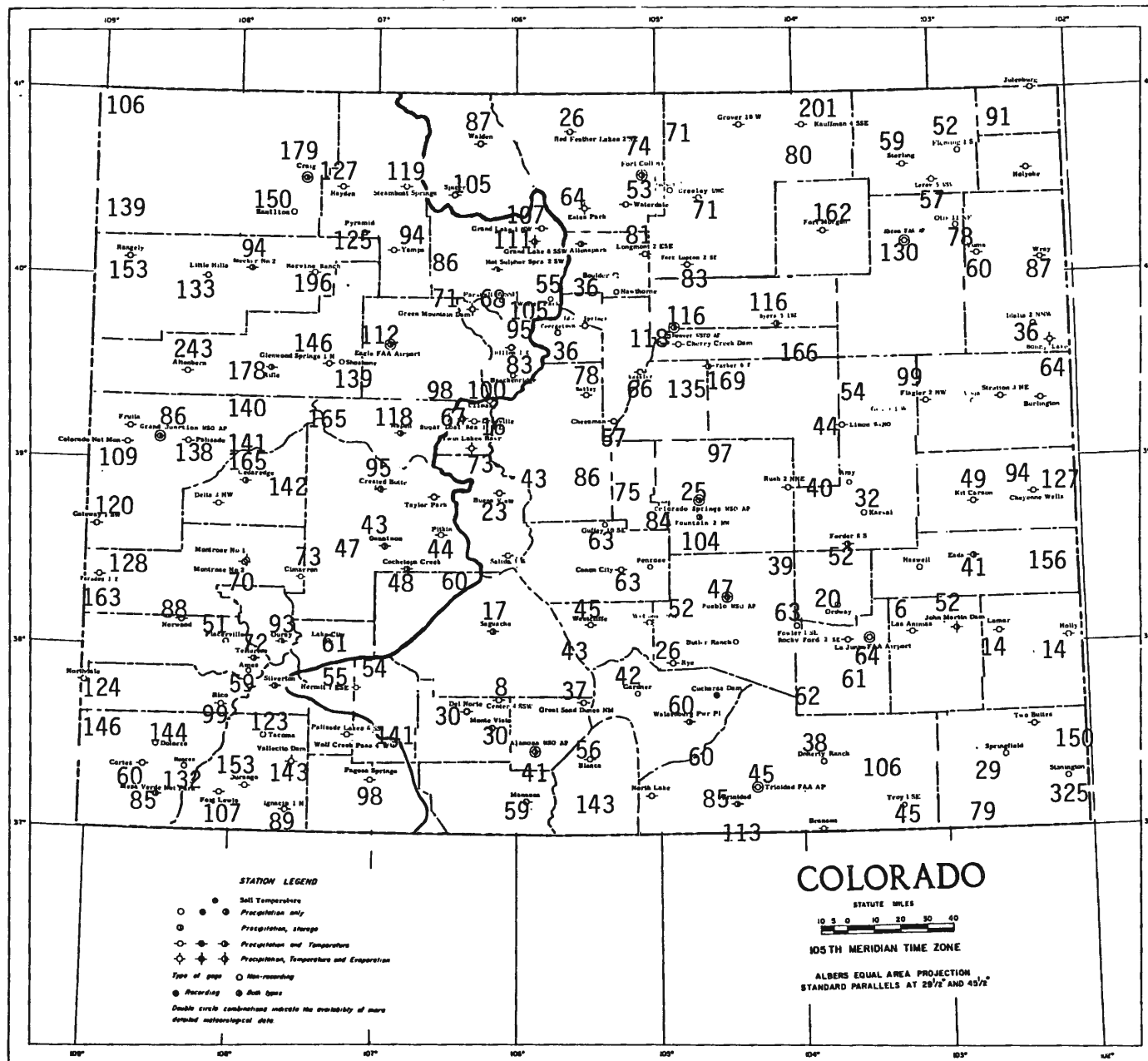


Figure 5. November 1982 Heating Degree Days (in parentheses) and percent above or below the 1941-1970 average.

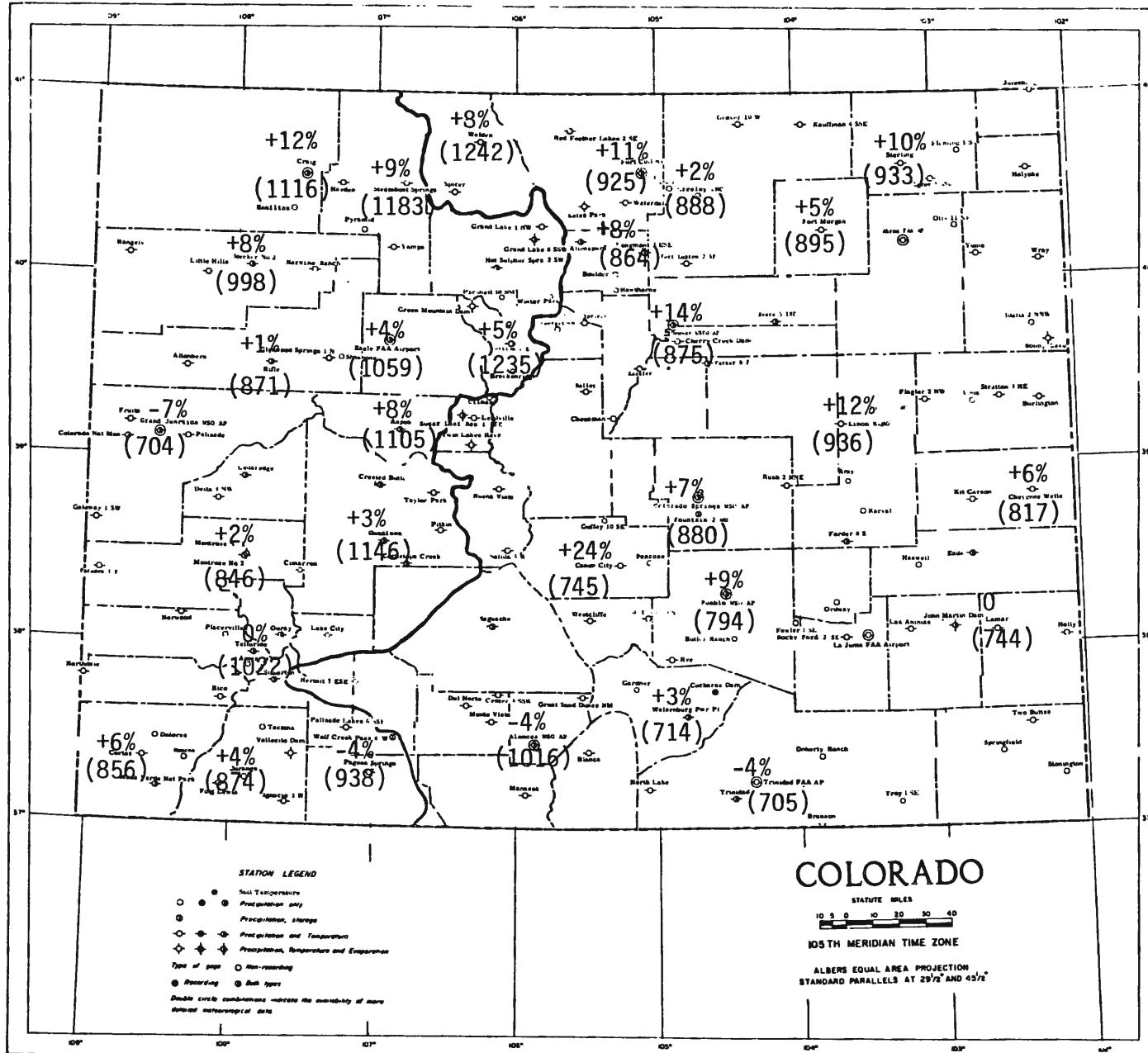


Table 1. Colorado Heating Degree Day Data through November 1982.

		JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	ANNUAL															
		JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	ANNUAL	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	ANNUAL		
Alamosa	average	55	96	294	648	1053	1420	1482	1182	1054	714	440	171	8609	Greeley	average	0	5	153	465	870	1147	1256	991	911	528	253	60	6639
	1981-82	14	108	254	656	904	1366	1457	1192	977	736	508	230	8402		1981-82	5	9	31	459	651	1014	1170	942	721	511	275	82	5870
	1982-83	59	47	274	714	1016										1982-83	5	0	154	478	888								
Aspen	average	113	161	345	654	1026	1324	1392	1176	1144	792	530	291	8948	Gunnison	average	103	169	384	704	1110	1538	1686	1397	1246	789	533	282	9941
	1981-82	98	147	298	721	916	1279	1408	1190	1079	897	609	366	9008		1981-82	63	165	328	709	977	1354	1693	1517	1093	786	564	379	9628
	1982-83	148	119	362	808	1105										1982-83	132	89	374	778	1146								
Boulder	average	6	0	139	367	690	905	992	826	809	482	236	88	5540	Lamar	average	0	0	57	320	741	1032	1107	854	766	377	129	19	5402
	1981-82	4	14	36	444	562	866	964	818	649	440	279	107	5183		1981-82	0	0	27	287	575	963	1076	988	615	364	117	22	5034
	1982-83	4	0	154	442											1982-83	0	0	41	317	744								
Burlington	average	0	0	102	363	741	1011	1085	882	828	462	210	54	5738	Limon	average	8	6	144	448	834	1070	1156	960	936	570	299	100	6531
	1981-82	10	7	25	377	601	940	1155	990	727	499	213	78	5622		1981-82	6	26	83	516	704	1071	1244	1066	850	660	363	176	6765
	1982-83	0	5	99	405	818										1982-83	18	5	184	539	936								
Canon City	average	0	0	57	285	600	806	877	728	713	402	158	34	4660	Longmont	average	0	7	155	457	828	1076	1184	952	902	537	269	92	6459
	1981-82	2	9	35	495	761						253	84	---		1981-82	5	12	38	481	652	979	1156	952	730	485	280	98	5868
	1982-83	3	6	109	391	745										1982-83	7	0	164	517	894								
Colorado Springs	average	9	13	155	456	825	1054	1128	944	921	564	301	103	6473	Meeker	average	28	56	261	564	927	1240	1345	1086	998	651	394	164	7714
	1981-82	5	30	70	433	640	993	1095	1001	827	571	374	163	6202		1981-82	8	72	160	572	847	1098	1254	1080	884	731	442	207	7355
	1982-83	8	11	198	532	880										1982-83	33	7	245	657	998								
Cortez	average	0	10	110	425	807	1104	1156	904	834	534	274	81	6239	Montrose	average	0	9	129	435	828	1132	1197	935	834	510	245	71	6325
	1981-82	2	7	83	499	726	1076	1230	1037	825	609	362	109	6565		1981-82	0	8	38	466	714	1074	1185	976	727	525	262	47	6022
	1982-83	17	5	132	606	856										1982-83	4	2	111	556	846								
Craig	average	32	58	275	608	996	1342	1479	1193	1094	687	419	193	8376	Pagosa Springs	average	95	114	291	611	981	1311	1401	1140	1048	711	481	233	8417
	1981-82	19	35	149	697	901	1260	1529	1277	987	838	506	209	8407		1981-82	19	102	244	642	856	1265	1525	1197	1006	708	495	269	8328
	1982-83	37	5	271	752	1116										1982-83	76	29	253	732	938								
Delta	average	0	0	94	394	813	1135	1197	890	753	429	167	31	5903	Pueblo	average	0	0	55	335	726	992	1082	848	775	405	148	28	5394
	1981-82	0	1	17	375	673	966	1123	894	625	451	163	12	5300		1981-82	0	0	22	272	554	937	1046	882	582	358	151	21	4825
	1982-83	2	4	81	496											1982-83	0	0	63	427	794								
Denver	average	0	0	120	408	768	1004	1088	902	868	525	253	80	6016	Rifle	average	7	22	167	481	861	1200	1296	997	859	537	283	85	5394
	1981-82	0	12	19	375	570	898	1070	918	733	522	306	92	5515		1981-82	0	42	513	760	1173	1342	1056	774	603	323	105	---	
	1982-83	3	0	151	487	875										1982-83	8	3	150	596	871								
Dillon	average	291	341	519	809	1173	1442	1519	1319	1321	966	701	453	10854	Salida	average	28	69	240	536	854	1094	1132	958	905	588	369	139	6910
	1981-82	243	302	448	835	1027	1379	1520	1323	1238	1058	746	507	10626		1981-82	22	67	168	537	---	1033	1179	1096	---	---	---	---	---
	1982-83	318	253	511	959	1235										1982-83	--	--	---	---	---								
Durango	average	20	37	198	502	843	1147	1212	958	880	597	375	161	6930	Steamboat Springs	average	116	159	384	691	1086	1451	1553	1277	1190	789	521	306	9523
	1981-82	9	22	125	531	764	1047	1311	1004	845	599	383	145	6785		1981-82	83	141	257	734	973	1340	1502	1361	1069	878	589	380	9307
	1982-83	24	6	175	614	874										1982-83	146	80	368	791	1183								
Eagle	average	43	79	285	626	1023	1386	1457	1168	1051	693	425	190	8426	Sterling	average	0	6	158	459	849	1150	1249	986	927	522	256	76	6638
	1981-82	6	54	155	632	889	1244	1451	1206	904	753	479	234	8007		1981-82	8	20	79	448	755	1085	1321	1042	832	595	337	122	6644
	1982-83	54	21	257	720	1059										1982-83	3	3	154	518	933								
Fort Collins	average	7	12	175	477	834	1076	1184	960	918	558	297	101	6599	Telluride	average	185	229	399	676	1017	1290	1333	1140	1147	825	583	345	9169
	1981-82	8	8	42	487	661	987	1142	926	741	527	295	115	5939		1981-82	117	177	320	707	891	1209	1323	1131	1062	815	582	325	8659
	1982-83	4	0	178	509	925										1982-83	139	140	364	746	1022								
Fort Morgan	average	0	0	132	439	849	1141	1262	986	899	509	233	61	6511	Trinidad	average	0	0	81	364	732	980	1054	868	822	471	212	58	5642
	1981-82	3	11	37	421	650	1035	1199	981	742	516	234	81	5910		1981-82	0	15	39	316	524	849	935	897	624	428	211	49	4887
	1982-83	3	3	123	492	895										1982-83	0	0	66	367	705								
Grand Junction	average	0	0	60	324	756	1101	1190	879	738	404	133	20	5606	Walden	average	197	270	489	803	1149	1438	1538	1313	1280	891	626	363	10357
	1981-82	0	0	12	439	696	1039	1203	841	581	405	136	6	5358		1981-82	143	241	357	831	1007	1314	1444	1262	1114	958	703	412	9786
	1982-83	2	0	61	397	704										1982-83	201	141	469	878	1242								
															Walsenburg	average	6	12	93	364	690	911	977</						

COLORADO CLIMATE -- DECEMBER 1982

Colorado Climate Center
Department of Atmospheric Science
Colorado State University

December, for the most part, was a mild and calm winter month. However, one 24-hour period, which happened to be Christmas Eve Day, found a place in the record book. The "Blizzard of '82" will long be remembered.

Significant Highlights -- December

<u>Date</u>	<u>Event</u>
1	Very deep low pressure area crossed the state. Near-record low surface pressure readings. Storm brought moderate precipitation to mountain areas and southwest. Just a few rain/snow showers east of mountains.
2-6	Clearing and cooler 2-3. Some lingering mountain snows. Warmer, especially east of mountains 4-6. Light snows Northern and Central Mountains on the 5th. Trace rainshowers on the Plains.
7-11	Arctic air mass in northern Great Plains brought much colder air and light upslope snow and freezing drizzle to eastern Colorado 7-9. 6" snow at Fort Collins. Very bad driving conditions Front Range. Cool and dry in the mountains and western valleys. A weak upper air disturbance brought warm temperatures and rain to much of the western half of the state on the 10th, gradually clearing on the 11th.
12-15	Mild and dry east of mountains. Fast moving upper air disturbance triggered snow showers mountains and valleys 13-14th, mostly light. Briefly cooler statewide 14-15.
16-22	Dominant high pressure ridge. Warm and dry statewide. Just a few high elevation snowshowers early in the period. Very warm, especially east of the mountains, on the 17th. 60's and 70's common. 78° at Walsh (extreme southeastern Colorado) on the 17th was the warmest in the state.
23-25	The Blizzard of 1982 (see special section) very windy and sharply cooler
26-28	Very cold statewide. A second major snowstorm clipped southeastern Colorado with freezing rain, snow and wind on the 27th. Up to 6" fell across the southeast plains with

DateEvent

	nearly a foot of snow in the Trinidad area. Mountain snows fell on the 28th, mostly light.
29-31	The coldest weather of the winter. Clear and dry. Below zero temperatures at night nearly everywhere in the state. Denver, -7° F 29th and 30th. Durango, -7° F on the 29th. Grand Junction, +9° F on the 30th. -20's many mountain sites. Taylor Park Dam dipped to -36° F on the 29th, the coldest in the state.

Precipitation Summary

Storm events were few in December. The majority of the month's precipitation was produced by three storms: one at the beginning of the month, one on Christmas Eve Day, and one just after Christmas. Precipitation totals and percents of average are shown in Figures 1 and 2. Unusually great precipitation totals were observed over much of the eastern half of Colorado with many areas reporting 2 to 5 times more precipitation than average. More than two inches of water equivalent precipitation was observed at Akron, Denver, and Walsenburg. The Akron total of 2.78" was 11 times the average. There were still some dry areas which missed the brunt of the storms. The upper Arkansas, portions of the San Luis Valley, a tiny area north of La Junta, and the northern half of Weld and Larimer counties were all considerably drier than usual. Buena Vista received only 0.02" for the month, 3 percent of average.

Mountain precipitation was generally near or below average for December. While the Northern Mountains from Berthoud Pass to Steamboat Springs were a littler snowier than normal (Berthoud Pass 4.20", 123 percent of average), the San Juans were a bit below average and the Central Mountain areas were quite dry (Aspen 0.92", 38 percent of average). Extreme southwestern Colorado received abundant precipitation for the month but most of the remaining western valleys received very little moisture. Gunnison and Delta each totalled only a trace.

Water-Year Precipitation to Date

Precipitation as a percent of average for the first 3 months of the 1983 water year is shown in Figure 3. The majority of the state is

near or above average. The largest exceptions are the San Luis Valley, the Gunnison drainage above Delta, and most of the Arkansas Valley from Leadville to Las Animas. Overall water supplies for the state remain in good shape for this time of year, although mountain snowpack has no longer been building up at a normal rate in recent weeks.

Temperature Summary

Below average temperatures for December were observed in central and southwestern Colorado (Figure 4). The remainder of the state was warmer than average ranging from about one degree Fahrenheit above average at Burlington, Trinidad, and Aspen, to five degrees warmer than usual at Grand Junction and six degrees above average at Gunnison.

Heating Degree Days

Heating Degree Day information is presented in Table 1 and in Figures 5 and 6. Most locations were within 5% of their long-term averages. Comparing to last year, which experienced a mild December, most cities showed substantially higher totals. Las Animas, Grand Junction, and Rifle were the exception showing somewhat smaller totals than a year ago. Most other stations showed December totals which were at least 5% greater than last year. That relates directly to increased demand for fuel to heat homes, schools, and businesses.

Special Summary -- The Blizzard of 1982

Much material has and will be written on the paralyzing blizzard of Christmas Eve 1982. There is no need to elaborate in great detail. The storm began early Thursday (Dec. 23) in the Colorado mountains -- not an unusual storm for the mountains by any means. Wolf Creek Pass picked up 14" Thursday with another 9" on Friday. With temperatures close to the freezing point, snow began to fall east of the mountains late on Thursday evening. Even before it fell, the National Weather Service boldly predicted developing blizzard conditions -- not just for the plains but even for the Denver metropolitan area.

The forecast quickly verified as strong winds blowing from the north soon accompanied the snowfall. Snow and wind continued throughout

the day Friday, concentrated in a band from the foothills west of Denver northeastward to Nebraska. The entire state experienced wind and snow, but the region of extremely heavy snow was quite small, centered near Denver. The winds, which were undoubtedly the most crippling element of the storm, frequently gusted above 40 mph east of the foothills. Gusts as high as 70 mph were recorded in some areas, and Colorado Springs averaged above 32 mph for the duration of the storm.

Because of the high winds, accurate measurements of snowfall and water equivalent were nearly impossible to take. Many inconsistencies were noted in the cooperative data. The most consistent and accurate measurement seemed to be snowdepth. Snowdepth data (or change in snowdepth) for the storm period are analyzed in Figure 7. The snowdepth pattern was very interesting with sharp gradients appearing in several areas. The storm maximized near the Denver metropolitan area with snowdepths approaching 3 feet up the South Platte canyon. Very heavy amounts were observed along the foothills from Colorado Springs to Fort Collins, up the Front Range spilling over the west side of the Continental Divide, on the north side of the Palmer Ridge, and in an untopographically related band extending northeast from Denver to the Nebraska border. While the Arkansas Valley was skipped by the snow, another maximum occurred from south of Canon City down to Trinidad.

Very heavy snowfalls occur from time to time at the eastern base of the mountains. What made this storm unusual was: 1) the fact that it was most severe in the most populated part of Colorado, 2) that it occurred in late December (Mid-winter is normally dry east of the mountains. It is also the time of year when snow which has fallen is least likely to melt quickly.), and 3) that the strong winds which are typical of Great Plains blizzards extended all the way up to the base of the foothills. The typical heavy snowfall producing an "upslope" storm is not accompanied by continuous high winds so close to the mountains.

Figure 1. December 1982 precipitation amounts (inches).

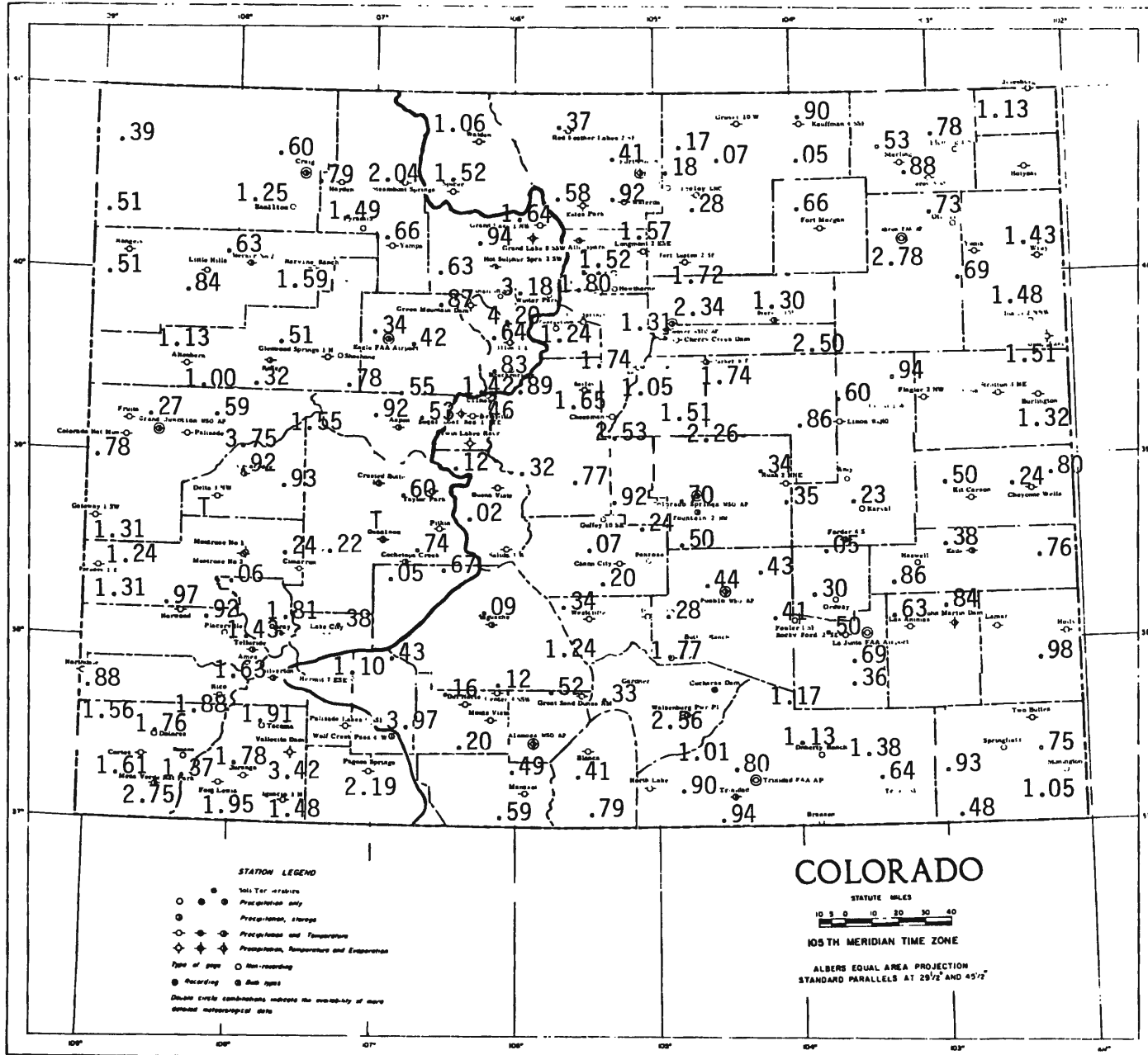


Figure 2. Precipitation for December 1982 as a percent of the 1961-1980 average.

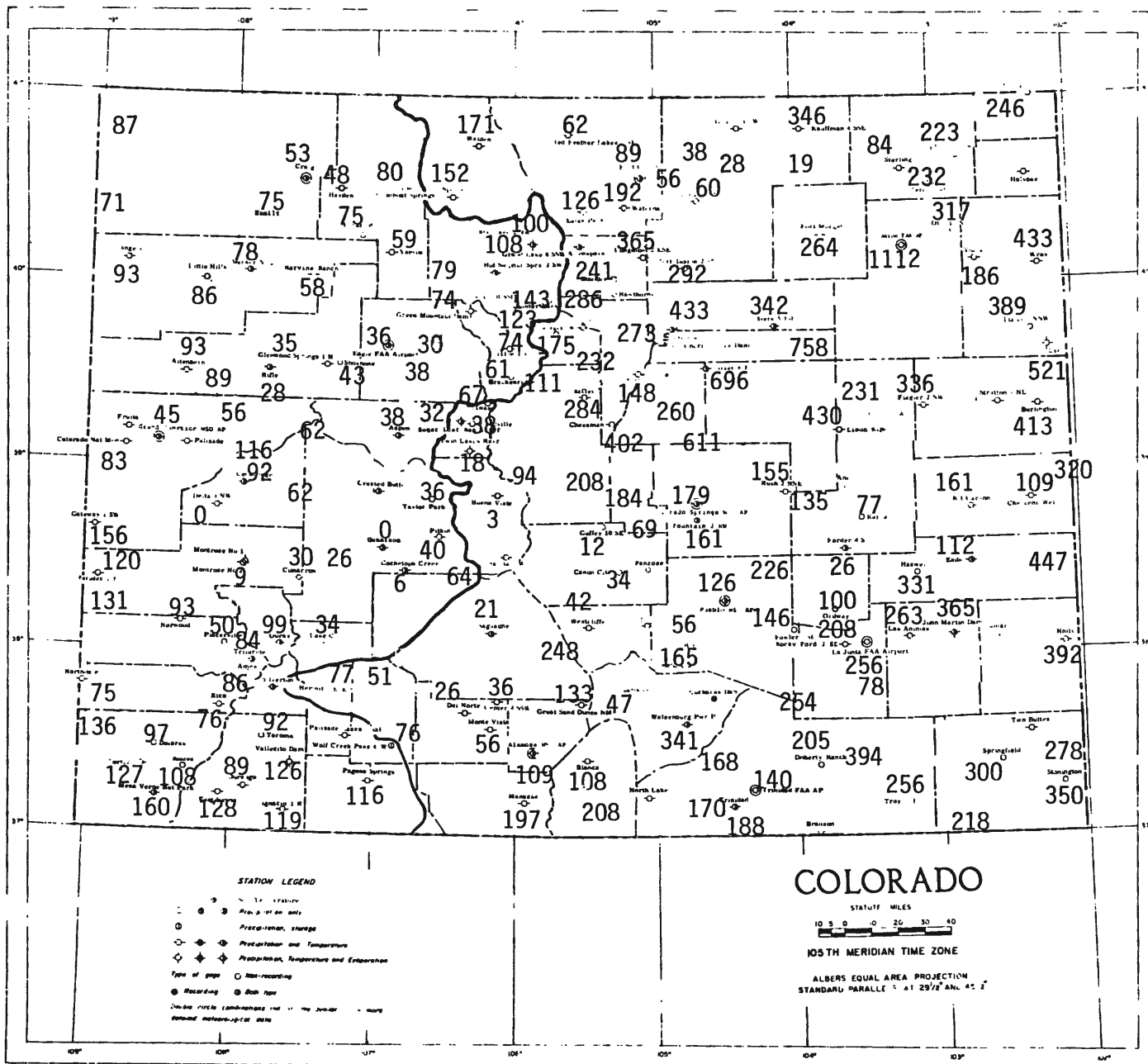


Figure 3. Precipitation for October 1982 through December 1982 as a percent of the 1961-1980 average.

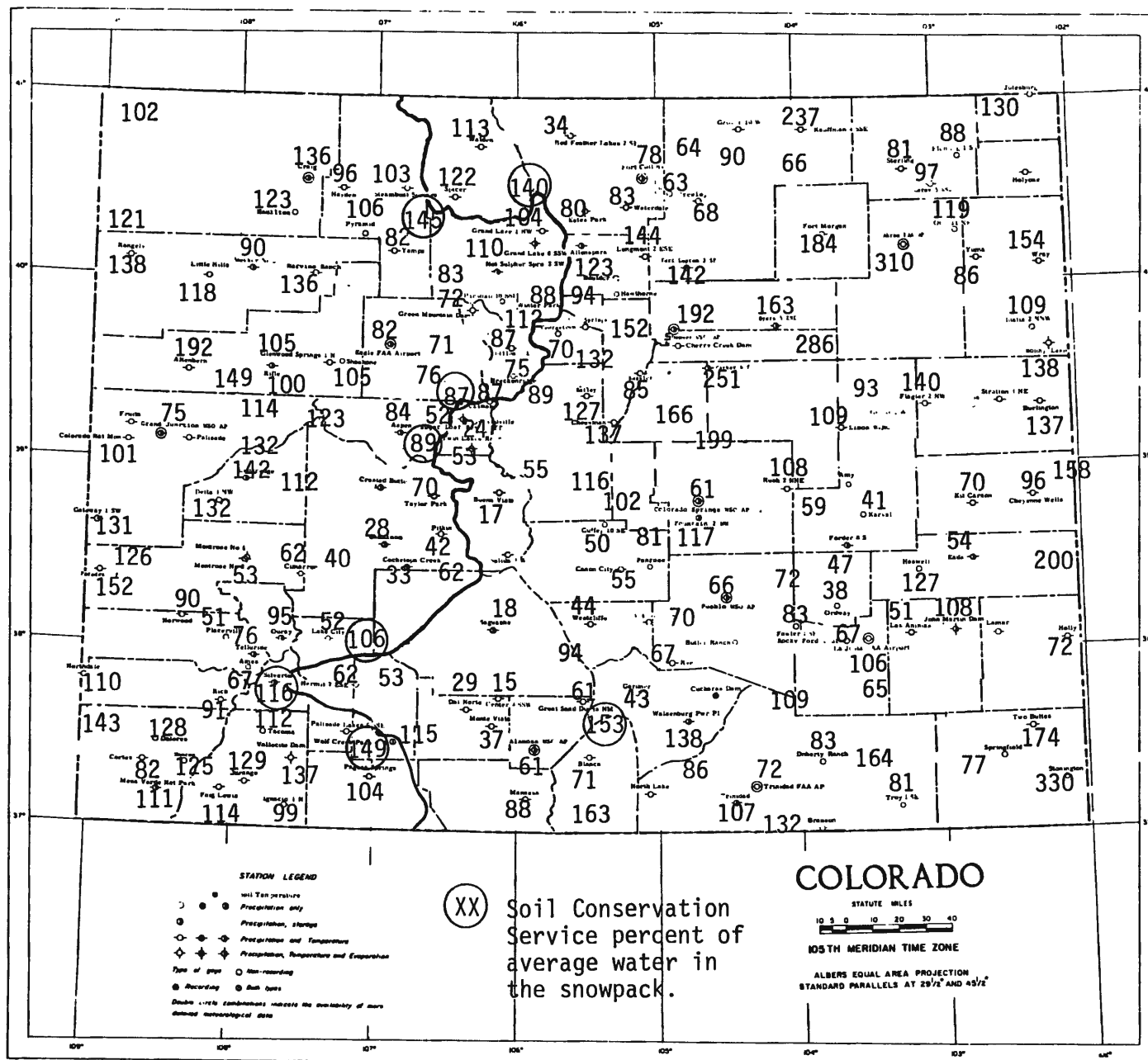


Figure 6. December 1982 Heating Degree Days as a percent above or below December 1981.

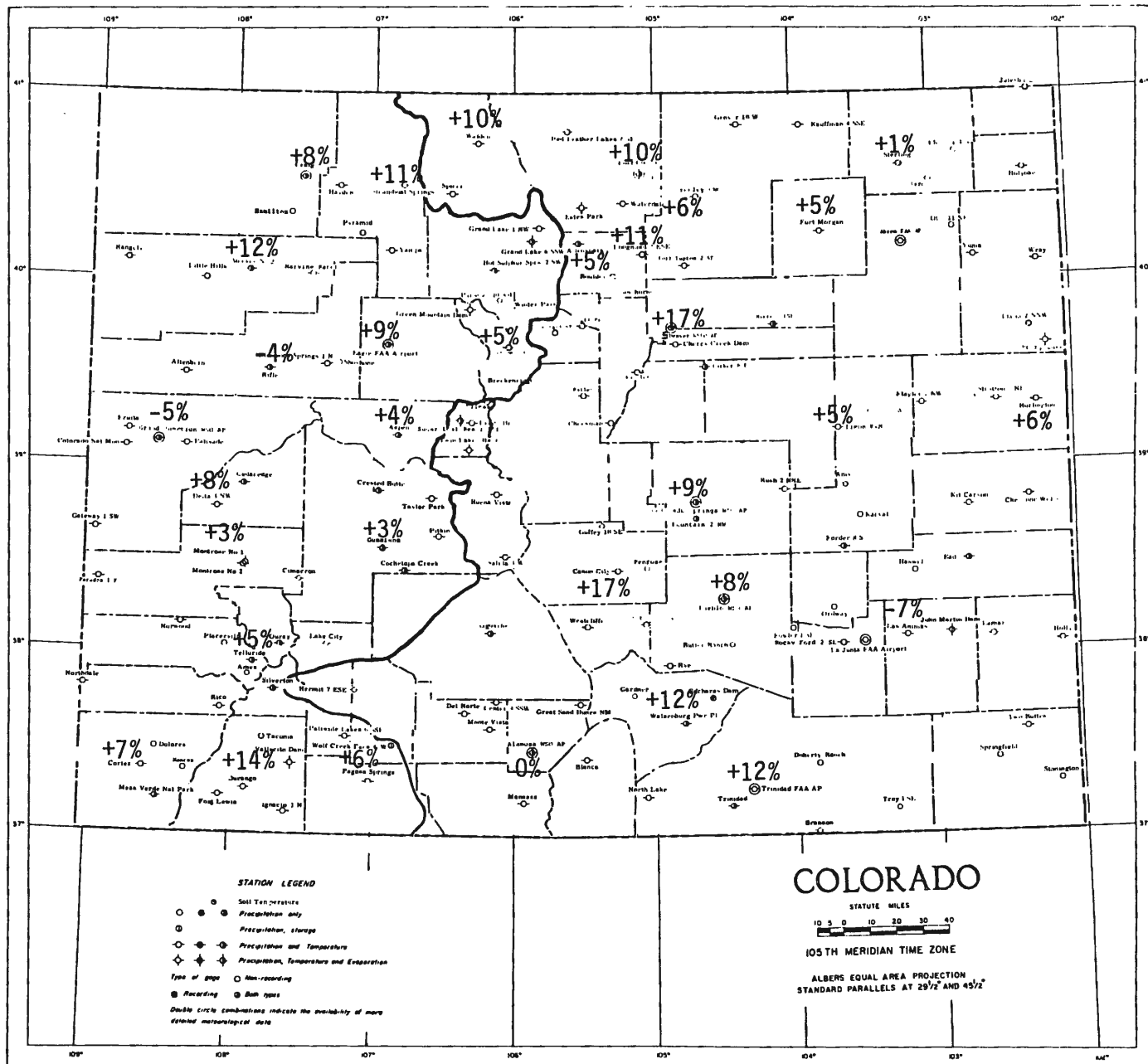


Figure 7. Maximum observed snowdepth or increase in snowdepth resulting from the snowstorm of December 23-25, 1982.

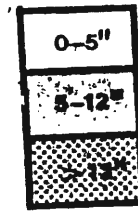
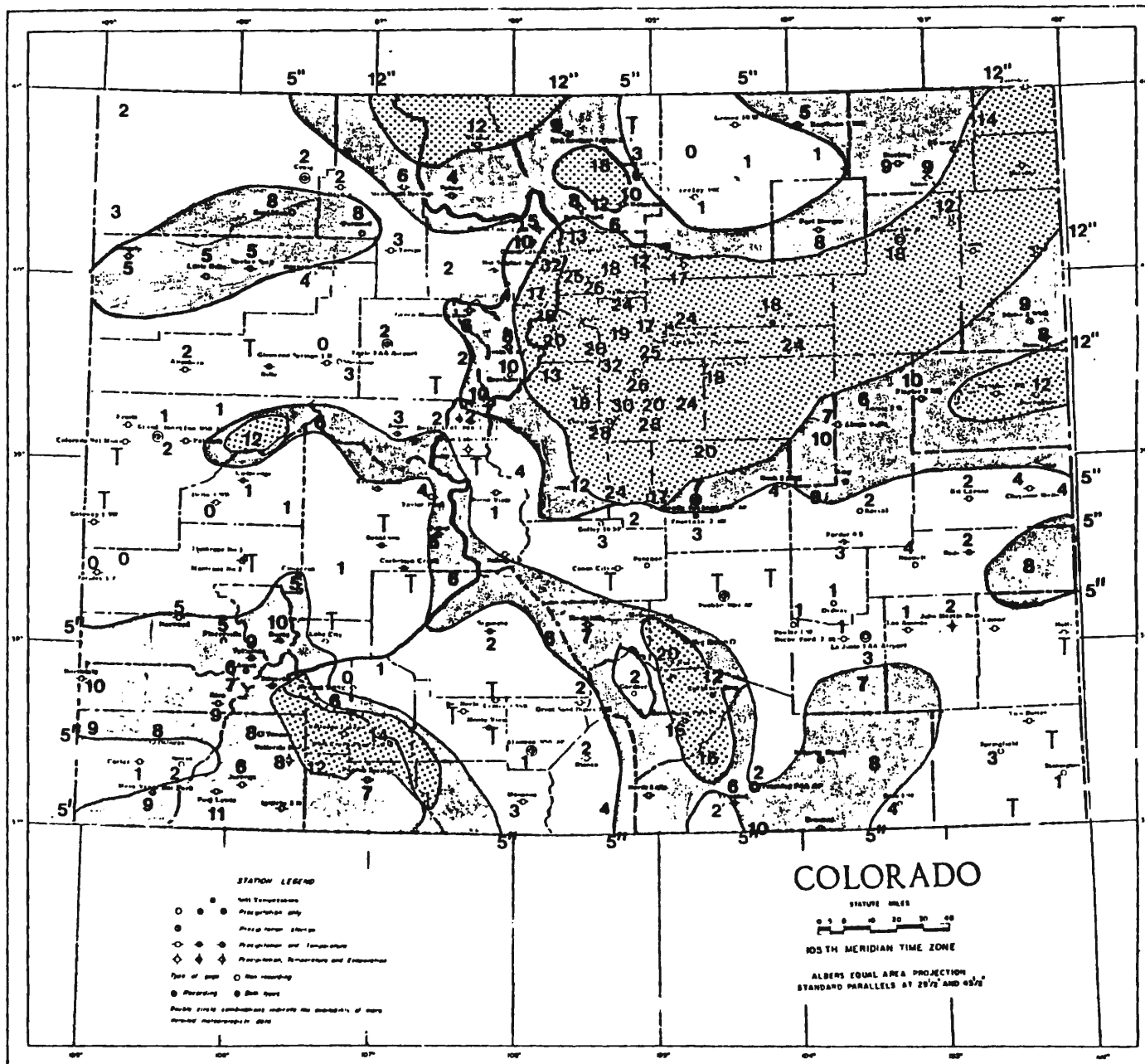


Table 1. Colorado Heating Degree Day Data through December 1982.

		JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	ANNUAL		JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	ANNUAL	
Greeley	average	0	5	153	465	870	1147	1256	991	911	528	253	60	6639	Alamosa	average	55	96	294	648	1053	1420	1482	1182	1054	714	440	171	8609
	1981-82	5	9	31	459	651	1014	1170	942	721	511	275	82	5870		1981-82	14	108	254	656	904	1366	1457	1192	977	736	508	230	8402
	1982-83	5	0	154	478	888	1075									1982-83	59	47	274	714	1016	1361							
Gunnison	average	103	169	384	704	1110	1538	1686	1397	1246	789	533	282	9941	Aspen	average	113	161	345	654	1026	1324	1392	1176	1144	792	530	291	8948
	1981-82	63	165	328	709	977	1354	1693	1517	1093	786	564	379	9628		1981-82	98	147	298	721	916	1279	1408	1190	1079	897	609	366	9008
	1982-83	132	89	374	778	1146	1394									1982-83	148	119	362	808	1105	1326							
Lamar	average	0	0	57	320	741	1032	1107	854	766	377	129	19	5402	Boulder	average	6	0	139	367	690	905	992	826	809	482	236	88	5540
	1981-82	0	0	27	287	575	963	1076	988	615	364	117	22	5034		1981-82	4	14	36	444	562	866	964	818	649	440	279	107	5183
	1982-83	0	0	41	317	744										1982-83	4	0	154	442	769	913							
Limon	average	8	6	144	448	834	1070	1156	960	936	570	299	100	6531	Burlington	average	0	0	102	363	741	1011	1085	882	828	462	210	54	5738
	1981-82	6	26	83	516	704	1071	1244	1066	850	660	363	176	6765		1981-82	10	7	25	377	601	940	1155	990	727	499	213	78	5622
	1982-83	18	5	184	539	936	1124									1982-83	0	5	99	405	818	999							
Longmont	average	0	7	155	457	828	1076	1184	952	902	537	269	92	6459	Canon City	average	0	0	57	285	600	806	877	728	713	402	158	34	4660
	1981-82	5	12	38	481	652	979	1156	952	730	485	280	98	5868		1981-82	2	9	35	495	761								---
	1982-83	7	0	164	517	894	1087									1982-83	3	6	109	391	745	890							
Meeker	average	28	56	261	564	927	1240	1345	1086	998	651	394	164	7714	Colorado Springs	average	9	13	155	456	825	1054	1128	944	921	564	301	103	6473
	1981-82	8	72	160	572	847	1098	1254	1080	884	731	442	207	7355		1981-82	5	30	70	433	640	993	1095	1001	827	571	374	163	6202
	1982-83	33	7	245	657	998	1225									1982-83	8	11	198	532	880	1084							
Montrose	average	0	9	129	435	828	1132	1197	935	834	510	245	71	6325	Cortez	average	0	10	110	425	807	1104	1156	904	834	534	274	81	6239
	1981-82	0	8	38	466	714	1074	1185	976	727	525	262	47	6022		1981-82	2	7	83	499	726	1076	1230	1037	825	609	362	109	6565
	1982-83	4	2	111	556	846	1104									1982-83	17	5	132	606	856	1148							
Pagosa Springs	average	95	114	291	611	981	1311	1401	1140	1048	711	481	233	8417	Craig	average	32	58	275	608	996	1342	1479	1193	1094	687	419	193	8376
	1981-82	19	102	244	642	856	1265	1525	1197	1006	708	495	269	8328		1981-82	19	35	149	697	901	1260	1529	1277	987	838	506	209	8407
	1982-83	76	29	253	732	938										1982-83	37	5	271	752	1116	1361							
Pueblo	average	0	0	55	335	726	992	1082	848	775	405	148	28	5394	Delta	average	0	0	94	394	813	1135	1197	890	753	429	167	31	5903
	1981-82	0	0	22	272	554	937	1046	882	582	358	151	21	4825		1981-82	0	1	17	375	673	966	1123	894	625	451	163	12	5300
	1982-83	0	0	63	427	794	1010									1982-83	2	4	81	496		1043							
Rifle	average	7	22	167	481	861	1200	1296	997	859	537	283	85	5394	Denver	average	0	0	120	408	768	1004	1088	902	868	525	253	80	6016
	1981-82	0	0	42	513	760	1173	1342	1056	774	603	323	105	---		1981-82	0	12	19	375	570	898	1070	918	733	522	306	92	5515
	1982-83	8	3	150	596	871	1129									1982-83	3	0	151	487	875	1050							
Salida	average	28	69	240	536	854	1094	1132	958	905	588	369	139	6910	Dillon	average	291	341	519	809	1173	1442	1519	1319	1321	966	701	453	10954
	1981-82	22	67	168	537	854	1033	1179	1096	---	---	---	---	---		1981-82	243	302	448	835	1027	1379	1520	1323	1238	1058	746	507	10626
	1982-83	---	---	---	---	---	---	---	---	---	---	---	---	---		1982-83	318	253	511	959	1235	1450							
Steamboat Springs	average	116	159	384	691	1086	1451	1553	1277	1190	789	521	306	9523	Durango	average	20	37	198	502	843	1147	1212	958	880	597	375	161	6930
	1981-82	83	141	257	734	973	1340	1502	1361	1069	878	589	380	9307		1981-82	9	22	125	531	764	1047	1311	1004	845	599	383	145	6785
	1982-83	146	80	368	791	1183	1482									1982-83	24	6	175	614	874	1197							
Sterling	average	0	6	158	459	849	1150	1249	986	927	522	256	76	6638	Eagle	average	43	79	285	626	1023	1386	1457	1168	1051	693	425	190	8426
	1981-82	8	20	79	448	755	1085	1321	1042	832	595	337	122	6644		1981-82	6	54	155	632	889	1244	1451	1206	904	753	479	234	8007
	1982-83	3	3	154	518	933	1098									1982-83	54	21	257	720	1059	1350							
Telluride	average	185	229	399	676	1017	1290	1333	1140	1147	825	583	345	9169	Fort Collins	average	7	12	175	477	834	1076	1184	960	918	558	297	101	6599
	1981-82	117	177	320	707	891	1209	1323	1131	1062	815	582	325	8659		1981-82	8	8	42	487	661	987	1142	926	741	527	295	115	5939
	1982-83	139	140	364	746	1022	1265									1982-83	4	0	178	509	925	1082							
Trinidad	average	0	0	81	364	732	980	1054	868	822	471	212	58	5642	Fort Morgan	average	0	0	132	439	849	1141	1262	986	899	509	233	61	6511
	1981-82	0	15	39	316	524	849	935	897	624	428	211	49	4887		1981-82	3	11	37	421	650	1035	1199	981	742	516	234	81	5910
	1982-83	0	0	66	367	705	949									1982-83	3	3	123	492	895	1086							
Walden	average	197	270	489	803	1149	1438	1538	1313	1280	891	626	363	10357	Grand Junction	average	0	0	60	324	756	1101	1190	879	738	404	133	20	5606
	1981-82	143	241	357	831	1007	1314	1444	1262	1114	958	703	412	9786		1981-82	0	0	12	439	696	1039	1203	841	581	405	136	6	5358
	1982-83	201	141	469	878	1242	1441									1982-83	2	0	61	397	704	983							
Walsenburg	average	6	12	93	364	690	911	977	820	806	4																		

COLORADO CLIMATE -- JANUARY 1983

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

January was an unusually cloudy month east of the mountains. The clouds failed to produce much precipitation, though, and most of the state ended up dry for the month. At the same time, temperatures were quite mild. With no major polar outbreaks, practically every day of the month was warmer than average.

Significant Highlights -- January

<u>Date</u>	<u>Event</u>
1-3	Cold and dry across the state. Plenty of snowcover remaining from December storms. Coldest weather of the month for most of the state. Denver +1° and Grand Junction +14°F on the 2nd. Lamar +3° and Cortez 0°F on the 3rd. Taylor Park Dam dipped to -34°F on the 1st and 2nd, coldest in the state.
4-8	Northwesterly flow aloft. Daily light snows Northern and Central Mountains. Otherwise mild and dry.
9	Windy and colder. Some mountain snows as Pacific cold front rushed across the state.
10-16	Large ridge of high pressure dominated Western U.S. Dry and unusually mild, except for very cold nights in snowcovered mountain valleys. 12th-14th were the warmest days of the month. Pueblo, 73°F on the 13th, warmest in the state, following a morning low of +12°F. Several record high temperatures set (e.g. Greeley, 68°F on the 13th).
17-22	Unsettled period with much colder temperatures east of the mountains and some precipitation over most of the state. Dense fog 18-22 over many lower elevation areas produced dangerous travel condition. Over 6.5" snow at Lamar and other parts of southeast Colorado.
23-30	Warm period but with several fast-moving storm systems crossing the state. Precipitation mostly light although high mountains received some snow almost everyday. Berthoud Pass totalled 18" new snow for the period. Only trace amounts east of the mountains.

- 31 Large storm system developed south of Colorado and produced some snow and much colder temperatures over most of southern and eastern Colorado. 1 to 6 inches new snow across the southeastern plains.

Precipitation Summary

There were no really heavy precipitation events in Colorado in January. The greatest 24-hour total anywhere in the state was 0.67" at Walsh in extreme southeastern Colorado on the 21st.

Precipitation totals and percents of average are shown in Figures 1 and 2. Totals in excess of one inch (water equivalent) were limited to the high elevations of the Northern and Central Mountains and to the southwestern corner of the state. Little or no precipitation was measured in northeastern Colorado. The only areas of the state which received above average precipitation were portions of the San Luis Valley, a small area near the Utah border in extreme southwestern Colorado, and much of the lower Arkansas Valley. The monthly total of 1.00 inches near Campo (extreme southeast Colorado) was nearly 5 times more than their January average. All mountain areas were much drier than average. Crested Butte, for example, received just 0.48 inches, 16 percent of average. Wolf Creek Pass totalled 1.11 inches compared to an average of 3.70 inches.

Water-Year Precipitation to Date

January normally is one of the wettest months of the year in the higher elevations of the mountains. The light precipitation this past month contributed to a sharp deterioration in the water supply outlook. Nearly all the high mountain areas are now below average for the year (see Figure 3) with the Central Mountain region dipping to less than 70 percent of average (only 25 percent of average at Gunnison). Conditions at lower elevations both east and west of the mountains remain favorable as above average precipitation has fallen in many of those areas.

Temperature Summary

All of Colorado was warmer than average in January (Figure 4) with some areas enjoying an exceptionally warm month. East of the mountains temperatures ranged from about 3 degrees Fahrenheit above average in the

Arkansas Valley to more than 8 degrees above average at Fort Morgan and Sterling. Even greater variations were noted in western Colorado. The southwest was about 3-4 degrees above average as were the Northern and Central Mountains. Grand Junction and Gunnison, however, were a toasty 10.5 and 11.9 degrees warmer than usual, respectively. Lack of midwinter snowcover in the Gunnison Valley contributed to these warm temperatures.

Heating Degree Days

Heating Degree Day information is presented in Table 1 and in Figures 5 and 6. The warm temperatures meant fewer heating degree days and less demand for fuel than would normally be expected. Totals were generally 5 to 20 percent less than average. Totals compared similarly to January 1982 which had been a fairly average month. This means that consumers in many parts of Colorado including Fort Collins, Sterling, Craig and Pagosa Springs, as well as Grand Junction and Gunnison will have lower utility bills than expected. I'm sure there won't be too many complaints.

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

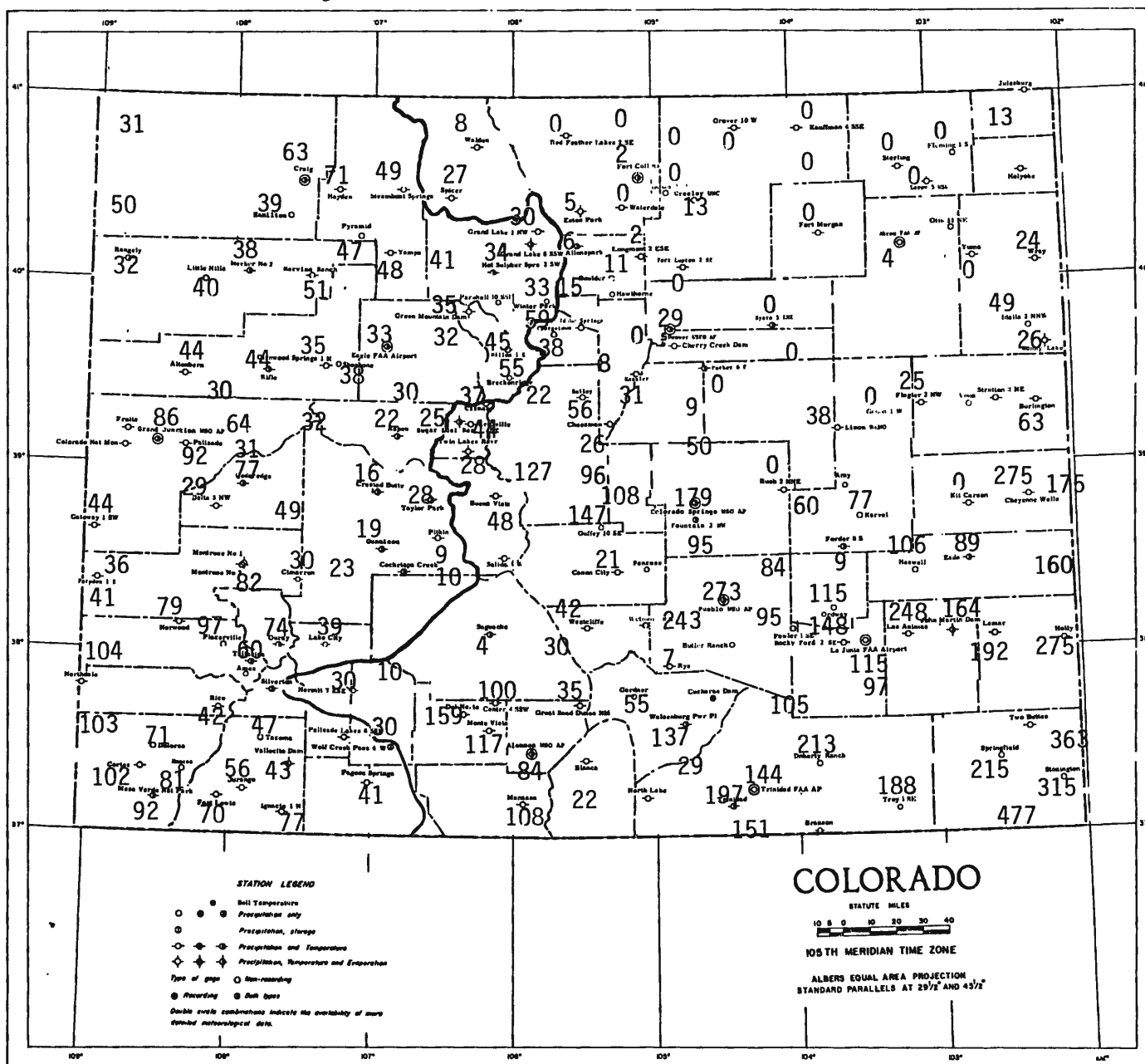


Figure 3. Precipitation for October 1982 through January 1983 as a percent of the 1961-1980 average.

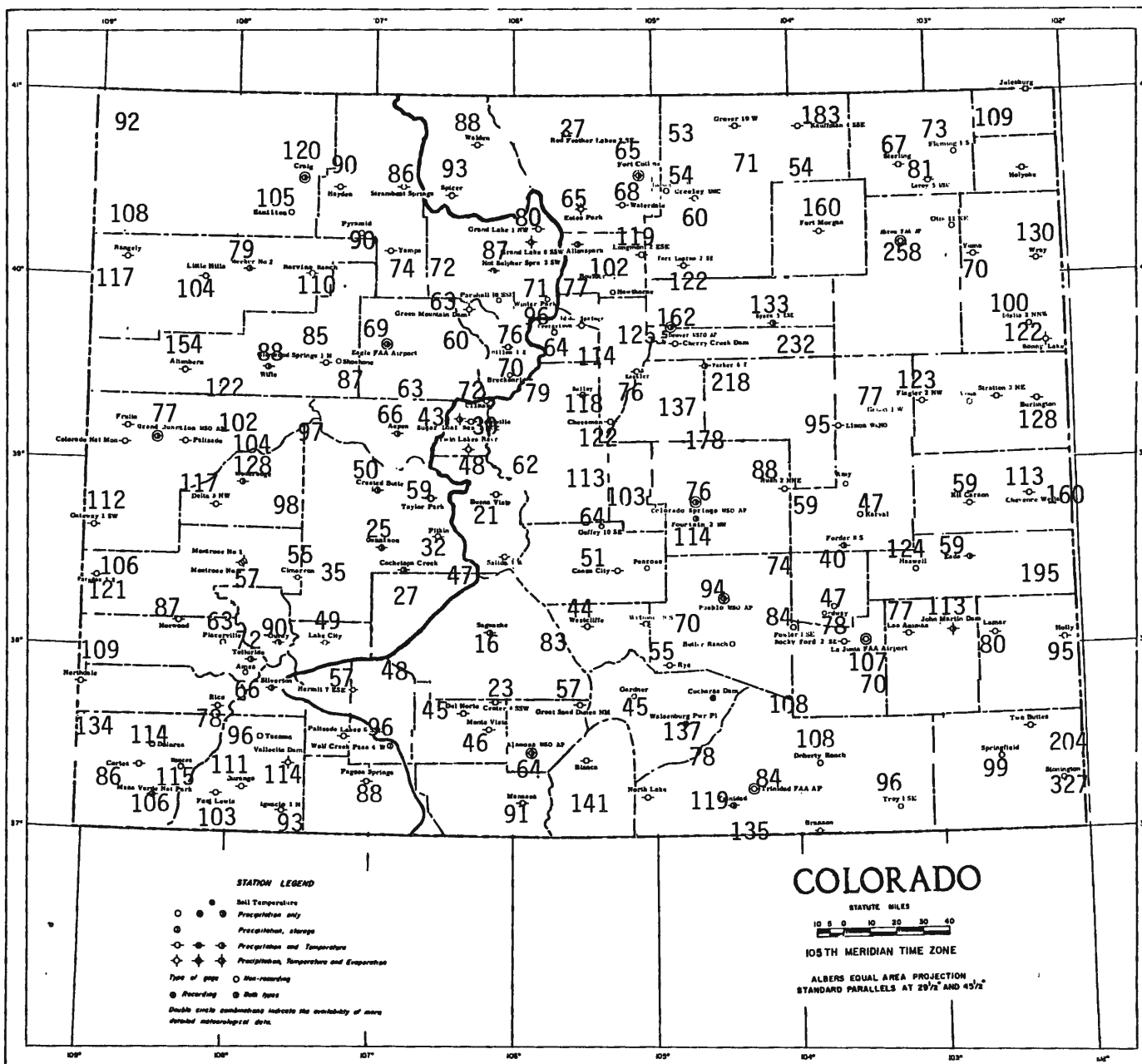


Figure 4. Temperatures for January 1983 in degrees Fahrenheit (in parentheses) and departures from the 1961-1980 average.

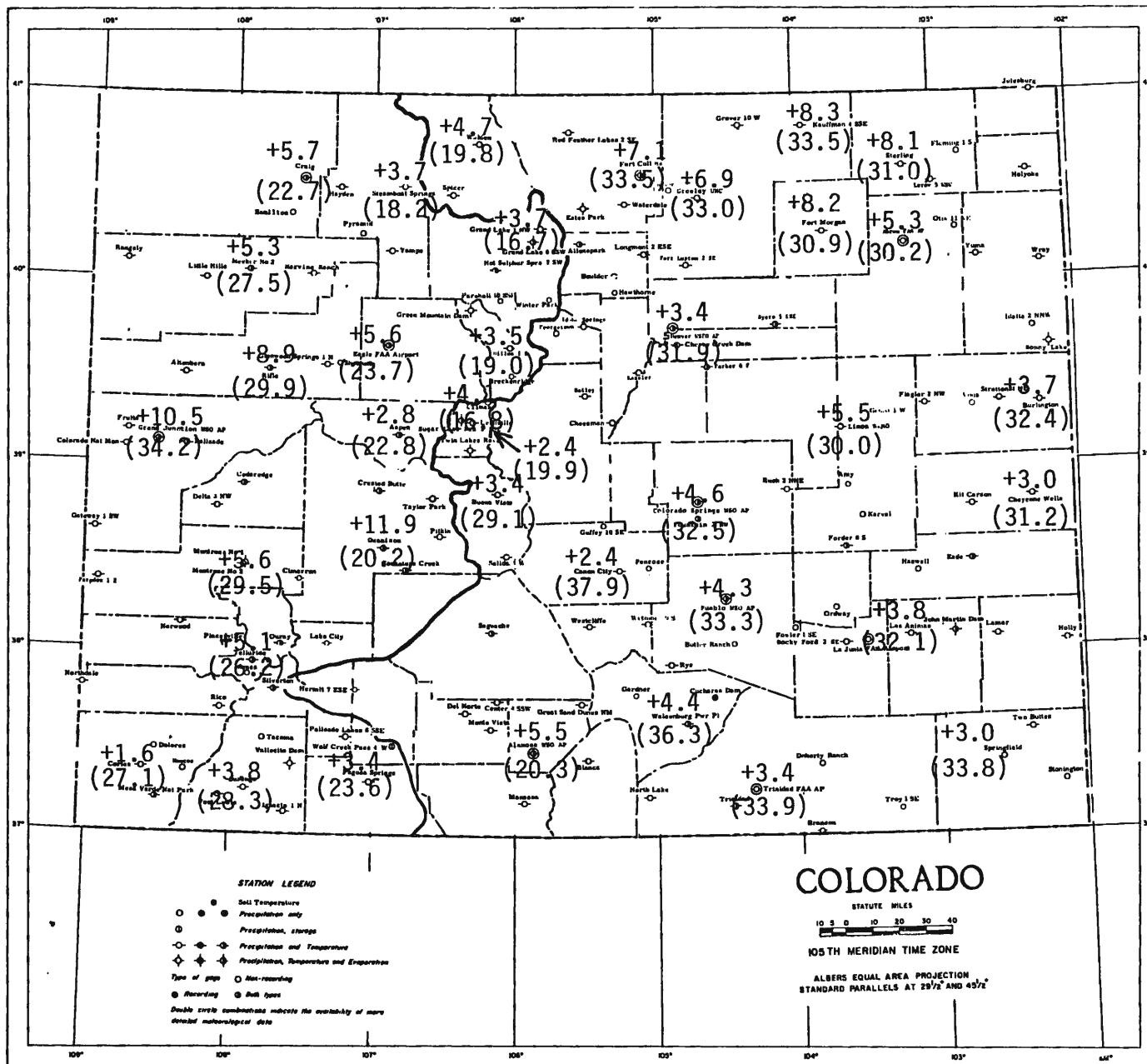


Figure 5. January 1983 Heating Degree Days (in parentheses) and percent above or below the 1941-1970 average.

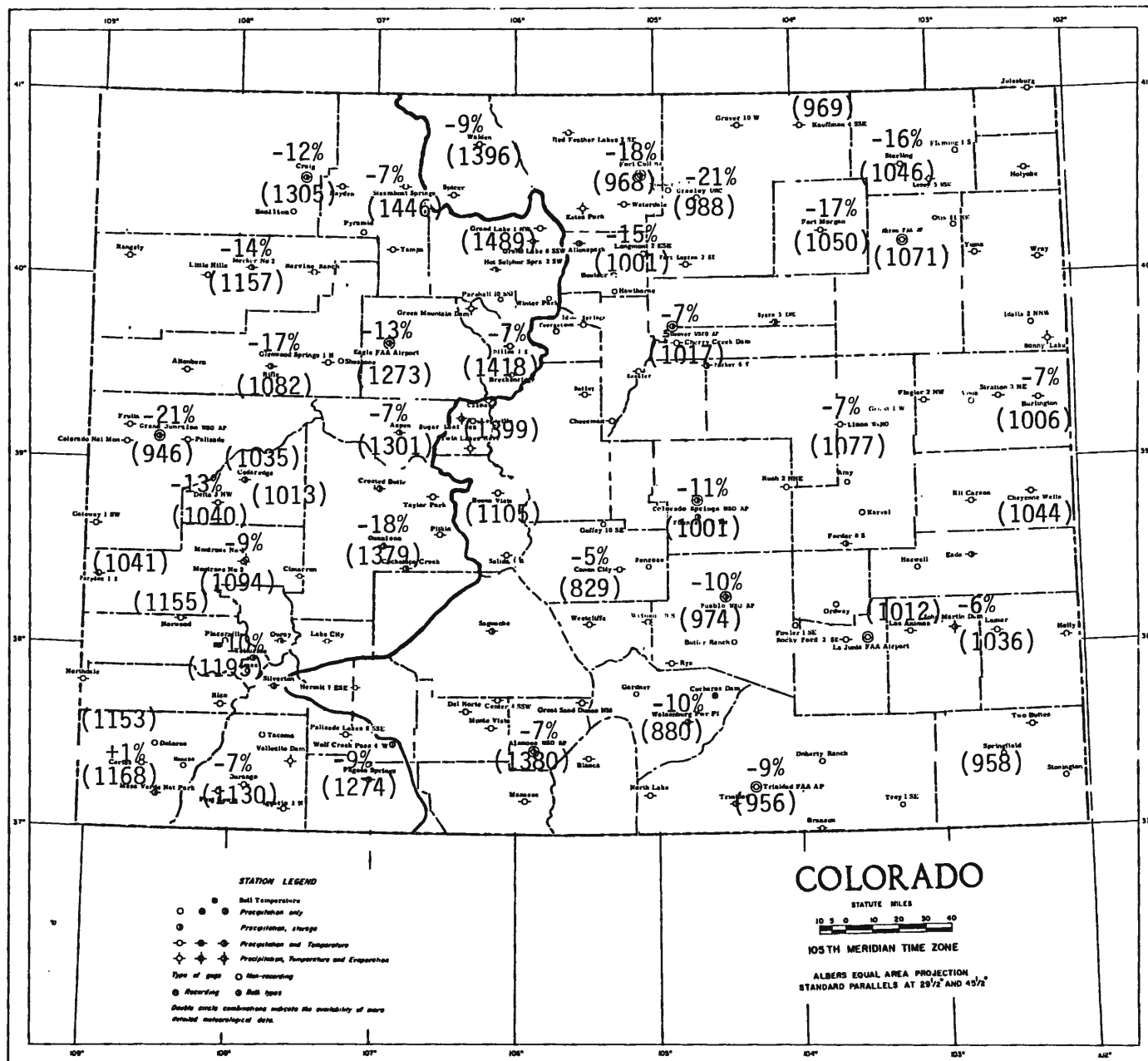


Table 1. Colorado Heating Degree Day Data through January 1983.

		JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	ANNUAL																		
Alamosa	average	55	96	294	648	1053	1420	1482	1182	1054	714	440	171	8609	Greeley	average	0	5	153	465	870	1147	1256	991	911	528	253	60	6639			
	1981-82	14	108	254	656	904	1366	1457	1192	977	736	508	230	8402		1981-82	5	9	31	459	651	1014	1170	942	721	511	275	60	6639			
	1982-83	59	47	274	714	1016	1361	1380								1982-83	5	0	154	478	888	1075	988							82	5870	
Aspen	average	113	161	345	654	1026	1324	1392	1176	1144	792	530	291	8948	Gunnison	average	103	169	384	704	1110	1538	1686	1397	1246	789	533	282	9941			
	1981-82	98	147	298	721	916	1279	1408	1190	1079	897	609	366	9008		1981-82	63	165	328	709	977	1354	1693	1517	1093	786	564	379	9941			
	1982-83	148	119	362	808	1105	1326	1301								1982-83	132	89	374	778	1146	1394	1379							379	9628	
Boulder	average	6	0	139	367	690	905	992	826	809	482	236	88	5540	Lamar	average	0	0	57	320	741	1032	1107	854	766	377	129	19	5402			
	1981-82	4	14	36	444	562	866	964	818	649	440	279	107	5183		1981-82	0	0	27	287	575	963	1076	988	615	364	117	22	5402			
	1982-83	4	0	154	442	769	913									1982-83	0	0	41	317	744	999	1036							22	5034	
Burlington	average	0	0	102	363	741	1011	1085	882	828	462	210	54	5738	Limon	average	8	6	144	448	834	1070	1156	960	936	570	299	100	6531			
	1981-82	10	7	25	377	601	940	1155	990	727	499	213	78	5622		1981-82	6	26	83	516	704	1071	1244	1066	850	660	363	176	6531			
	1982-83	0	5	99	405	818	999	1006								1982-83	18	5	184	539	936	1124	1077							176	6765	
Canon City	average	0	0	57	285	600	806	877	728	713	402	158	34	4660	Longmont	average	0	7	155	457	828	1076	1184	952	902	537	269	92	6459			
	1981-82	2	9	35	495	761	829					253	84	---		1981-82	5	12	38	481	652	979	1156	952	730	485	280	98	6459			
	1982-83	3	6	109	391	745	890									1982-83	7	0	164	517	894	1087	1001							98	5868	
Colorado Springs	average	9	13	155	456	825	1054	1128	944	921	564	301	103	6473	Meeker	average	28	56	261	564	927	1240	1345	1086	998	651	394	164	7714			
	1981-82	5	30	70	433	640	993	1095	1001	827	571	374	163	6202		1981-82	8	72	160	572	847	1098	1254	1080	884	731	442	207	7714			
	1982-83	8	11	198	532	880	1084	1001								1982-83	33	7	245	657	998	1225	1157							207	7355	
Cortez	average	0	10	110	425	807	1104	1156	904	834	534	274	81	6239	Montrose	average	0	9	129	435	828	1132	1197	935	834	510	245	71	6325			
	1981-82	2	7	83	499	726	1076	1230	1037	825	609	362	109	6565		1981-82	0	8	38	466	714	1074	1185	976	727	525	262	47	6325			
	1982-83	17	5	132	606	856	1148	1168								1982-83	4	2	111	556	846	1104	1094							47	6022	
Craig	average	32	58	275	608	996	1342	1479	1193	1094	687	419	193	8376	Pagosa Springs	average	95	114	291	611	981	1311	1401	1140	1048	711	481	233	8417			
	1981-82	19	35	149	697	901	1260	1529	1277	987	838	506	209	8407		1981-82	19	102	244	642	856	1265	1525	1197	1006	708	495	269	8417			
	1982-83	37	5	271	752	1116	1361	1305								1982-83	76	29	253	732	938	1338	1274							269	8328	
Delta	average	0	0	94	394	813	1135	1197	890	753	429	167	31	5903	Pueblo	average	0	0	55	335	726	992	1082	848	775	405	148	28	5394			
	1981-82	0	1	17	375	673	966	1123	894	625	451	163	12	5300		1981-82	0	0	22	272	554	937	1046	882	582	358	151	21	4825			
	1982-83	2	4	81	496	1043	1040									1982-83	0	0	63	427	794	1010	974							21	4825	
Denver	average	0	0	120	408	768	1004	1088	902	868	525	253	80	6016	Rifle	average	7	22	167	481	861	1200	1296	997	859	537	283	85	5394			
	1981-82	0	12	19	375	570	898	1070	918	733	522	306	92	5515		1981-82	0	4	42	513	760	1173	1342	1056	774	603	323	105	---	5394		
	1982-83	3	0	151	487	875	1050	1017								1982-83	8	3	150	596	871	1129	1082							105	---	
Dillon	average	291	341	519	809	1173	1442	1519	1319	1321	966	701	453	10854	Salida	average	28	69	240	536	854	1094	1132	958	905	588	369	139	6910			
	1981-82	243	302	448	835	1027	1379	1520	1323	1238	1058	746	507	10626		1981-82	22	67	168	537	1033	1179	1096	---	---	---	---	---	---	---	---	6910
	1982-83	318	253	511	959	1235	1450	1418								1982-83	--	--	---	---	---	---	---								---	
Durango	average	20	37	198	502	843	1147	1212	958	880	597	375	161	6930	Steamboat Springs	average	116	159	384	691	1086	1451	1553	1277	1190	789	521	306	9523			
	1981-82	9	22	125	531	764	1047	1311	1004	845	599	383	145	6785		1981-82	83	141	257	734	973	1340	1502	1361	1069	878	589	380	9523			
	1982-83	24	6	175	614	874	1197	1130								1982-83	146	80	368	791	1183	1482	1446							380	9307	
Eagle	average	43	79	285	626	1023	1386	1457	1168	1051	693	425	190	8426	Sterling	average	0	6	158	459	849	1150	1249	986	927	522	256	76	6638			
	1981-82	6	54	155	632	889	1244	1451	1206	904	753	479	234	8007		1981-82	8	20	79	448	755	1085	1321	1042	832	595	337	122	6638			
	1982-83	54	21	257	720	1059	1350	1273								1982-83	3	3	154	518	933	1098	1046							122	6644	
Fort Collins	average	7	12	175	477	834	1076	1184	960	918	558	297	101	6599	Telluride	average	185	229	399	676	1017	1290	1333	1140	1147	825	583	345	9169			
	1981-82	8	8	42	487	661	987	1142	926	741	527	295	115	5939		1981-82	117	177	320	707	891	1209	1323	1131	1062	815	582	325	9169			
	1982-83	4	0	178	509	925	1082	968								1982-83	139	140	364	746	1022	1265	1195							325	8659	
Fort Morgan	average	0	0	132	439	849	1141	1262	986	899	509	233	61	6511	Trinidad	average	0	0	81	364	732	980	1054	868	822	471	212	58	5642			
	1981-82	3	11	37	421	650	1035	1199	981	742	516	234	81	5910		1981-82	0	15	39	316	524	849	935	897	624	428	211	49	4887			
	1982-83	3	3	123	492	895	1086	1050								1982-83	0	0	66	367	705	949	956							49	4887	
Grand Junction	average	0	0	60	324	756	1101	1190	879	738	404	133	20	5606	Walden	average	197	270	489	803	1149	1438	1538	1313	1280	891	626	363	10357			
	1981-82	0	0	12	439	696	1039	1203	841	581	405	136	6	5358		1981-82	143	241	357	831	1007	1314	1444	1262	1114	958	703					

COLORADO CLIMATE -- FEBRUARY 1983

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

February was the second consecutive warmer than average month across the state of Colorado. Light snows fell almost every day in the mountains, but major storm events were few. Except for the northeast quarter of the state, precipitation was mostly near or above average.

Significant Highlights -- February

<u>Date</u>	<u>Event</u>
1-2	Storm system passed south and east of Colorado and brought light to moderate snows particularly to the southeastern plains. 3-6" snowfalls were common from Walsenburg to the Kansas border and as far north as Burlington.
3-7	Cold, unstable period. Coldest weather since late December but still not all that cold. Akron, +9°F on the 3rd. Denver and Colorado Springs, +11° on the 6th. Las Animas, +7° on the 7th. As usual, Taylor Park Dam east of Gunnison recorded the coldest temperatures in the state for the month, -38° on the 3rd and -37° on the 6th. Some scattered snowshowers fell throughout the period, especially in the mountains. Durango measured 9" of new snow on the 4th.
8-11	Westerly flow aloft brought steady light snows to the Northern and Central Mountains. Berthoud Pass totalled 16" of new snow in the period. Only scattered snows across the remainder of western Colorado. Dry and mild east of the mountains.
12	Dry statewide.
13-15	Brief period of light snow Northern and Central Mountains as upper air disturbance crossed the state. Mild statewide. Dry south and east.
16-17	Warm statewide. Another fast moving upper air disturbance triggered a period of snow in the mountains and rain and snow showers across much of the Eastern Plains. Walsh recorded .29" of precipitation on the 17th.
18	Dry and unusually warm. Warmest day of the month in many parts of the state. Craig, 52°F. Leadville, 48°F. Sterling, 68°F. Trinidad, La Junta, Las Animas and Bonny

Reservoir all shared honors for the warmest temperature in the state for February with a 70° reading.

- 19-20 Very strong storm system northwest of Colorado redeveloped to the southeast. Precipitation and strong winds over most of the state. Local areas of heavy mountain snows, but the heaviest precipitation occurred near the New Mexico border in southeastern Colorado. Aguilar recorded 12" snow (0.80" precip.). Troy, east of Trinidad totalled 17" of snow with a water equivalent of 1.66". Wootton Ranch just south of Trinidad received 1.71" of precip. (23" of snow) from the same storm.
- 21-24 Seasonal temperatures on the 21st followed by a strong warming trend accompanying a large high pressure ridge over the Rockies. Just a trace of snow in the high mountains on the 22nd. Very warm on the 24th in the mountains. Climax, 45°F on the 24th.
- 25-28 Continued dry and springlike east of the Continental Divide. Moist, southwesterly flow aloft brought abundant precipitation to western Colorado, particularly the southwest valleys. Durango totalled 0.93" of water equivalent precipitation. Rico measured 1.60" of precipitation (20.5" snow).

Precipitation Summary

Most areas of the state were near or above average for the month, but there was considerable variation. Precipitation totals ranged from a trace at Briggsdale, Fountain, and Kauffman 4SSE to more than 3 inches at Rico and Berthoud Pass. The wettest areas of the state, compared to average, were the western slopes of the San Juan Mountains, the upper Gunnison drainage, eastern portions of San Luis Valley, and much of southeastern Colorado. Several southeast plains stations reported more than 3 times their monthly average. Troy's total of 2.13" was a new record February total for that station.

Unusually dry conditions occurred throughout the South Platte drainage and in the upper Arkansas Valley. At least 10 reporting stations received less than 0.10" of precipitation for the month. Localized dry areas were also noted in the upper Colorado River Valley, in the Delta-Montrose area, and in northwestern portions of the San Luis Valley.

Temperature Summary

Colorado experienced warmer than average temperatures in February. The southeastern plains, southwestern valleys, and the Central Mountains were mostly one to three degrees above average. However, the northeast plains and some of the western valleys were much warmer than usual. Greeley, for example, was 8 degrees Fahrenheit above average. Gunnison was more than 10 degrees above average for the second consecutive month.

Heating Degree Days

Due to the warm temperatures, February heating degree day totals were considerably less than average over most of Colorado. Degree day totals ranged from 668 at Grand Junction (24% less than average) to 1280 near Grand Lake. Heating degree day totals were consistently about 10 to 20 percent lower than they were during the same period last year. Gunnison and Sterling totalled 26% and 27% fewer than last year, respectively. As a result, the demand for energy to heat homes, schools and businesses should have been considerably less than a year ago.

Figure 1. February 1983 precipitation amounts (inches).

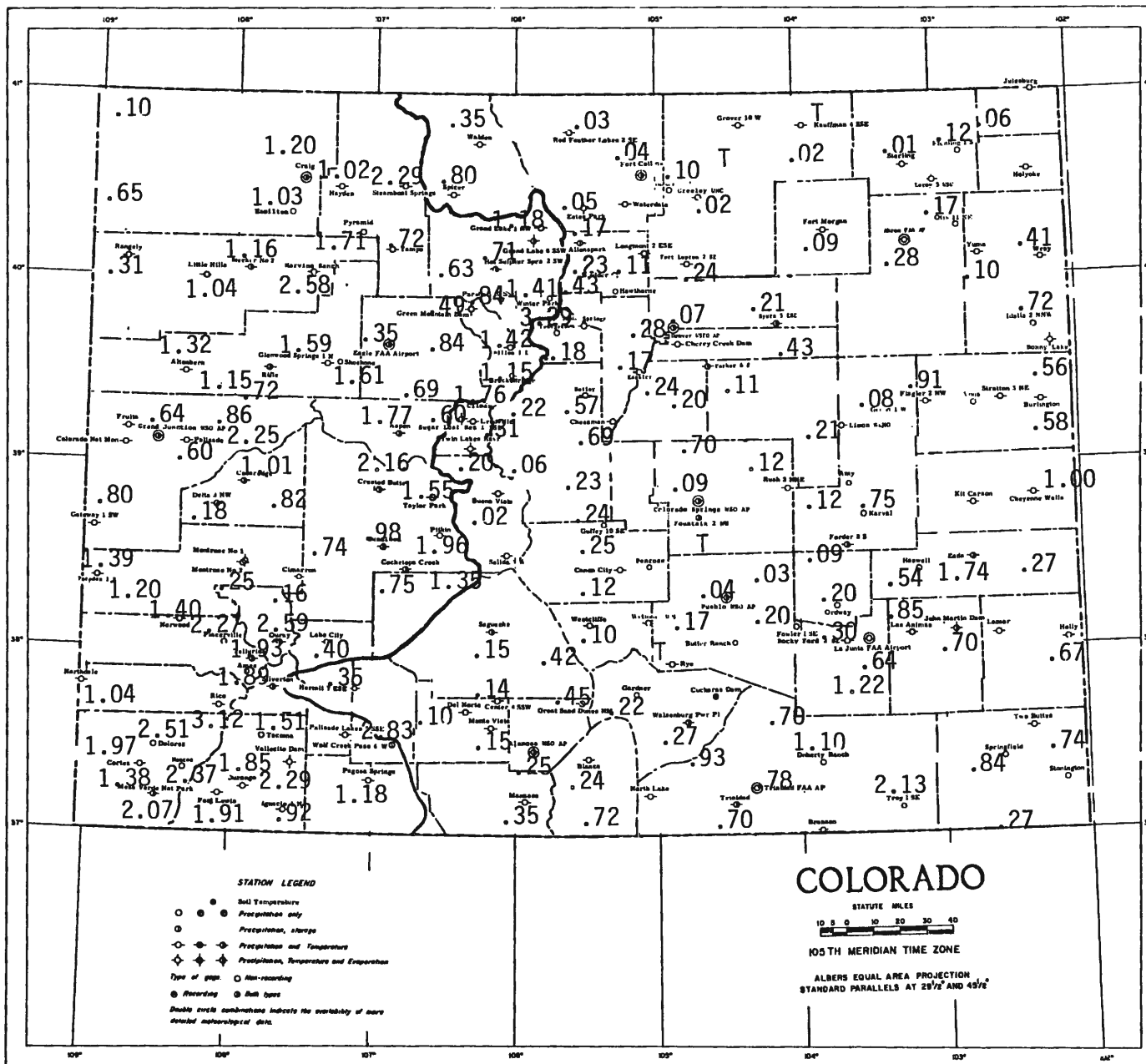


Figure 2. Precipitation for February 1983 as a percent of the 1961-1980 average.

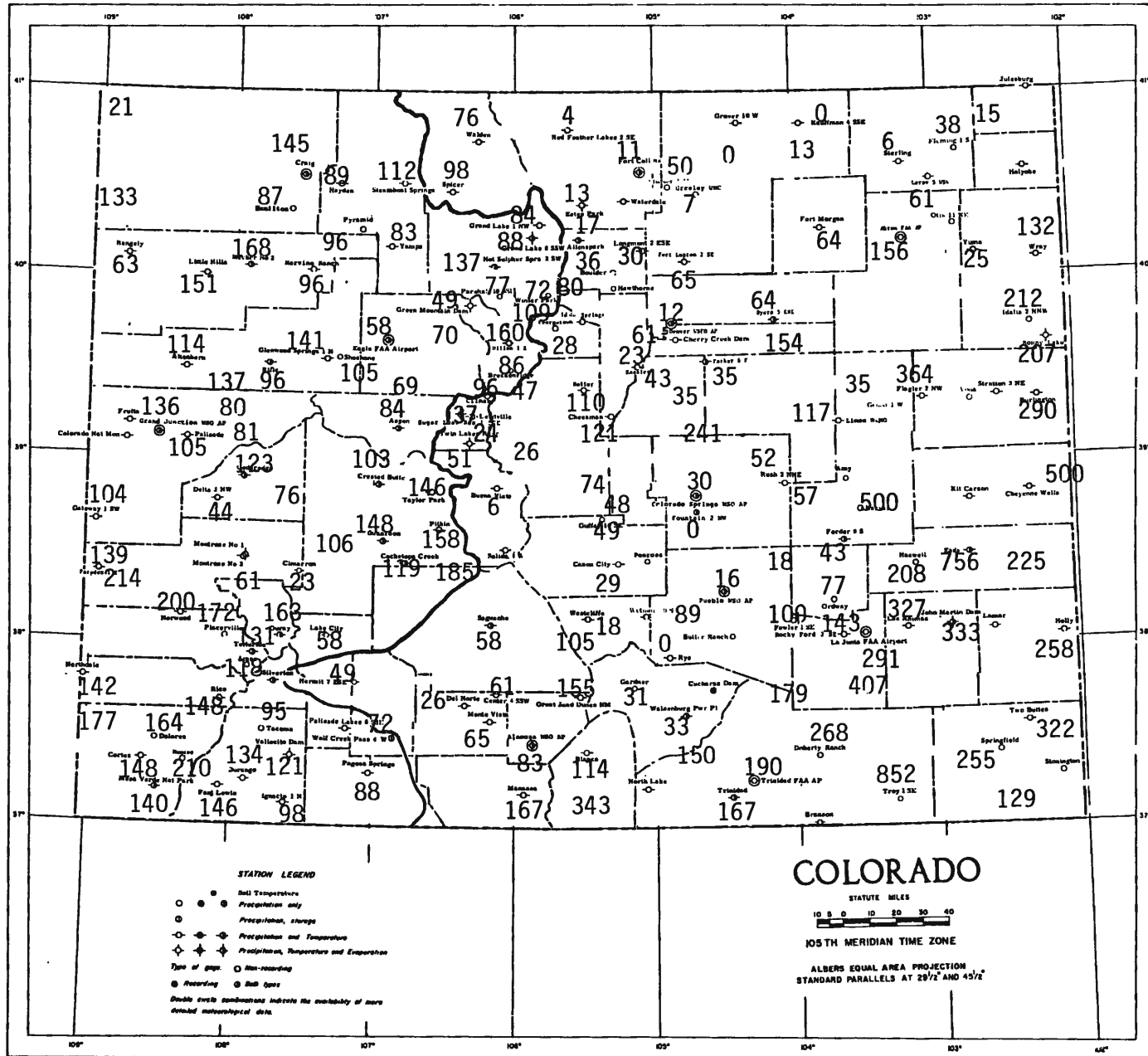


Figure 3. Precipitation for October 1982 through February 1983 as a percent of the 1961-1980 average.

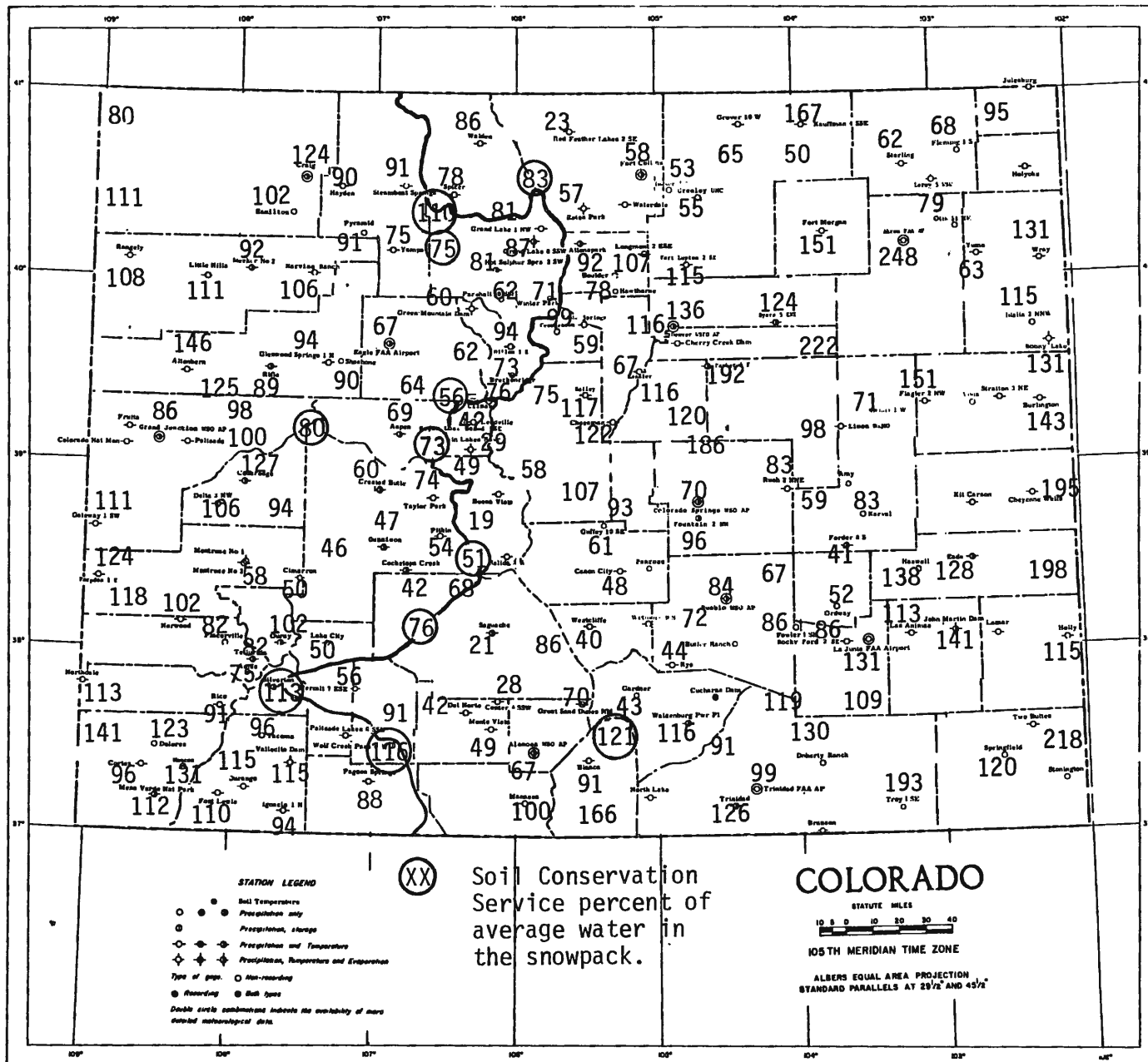


Figure 4. Temperatures for February 1983 in degrees Fahrenheit (in parentheses) and departures from the 1961-1980 average.

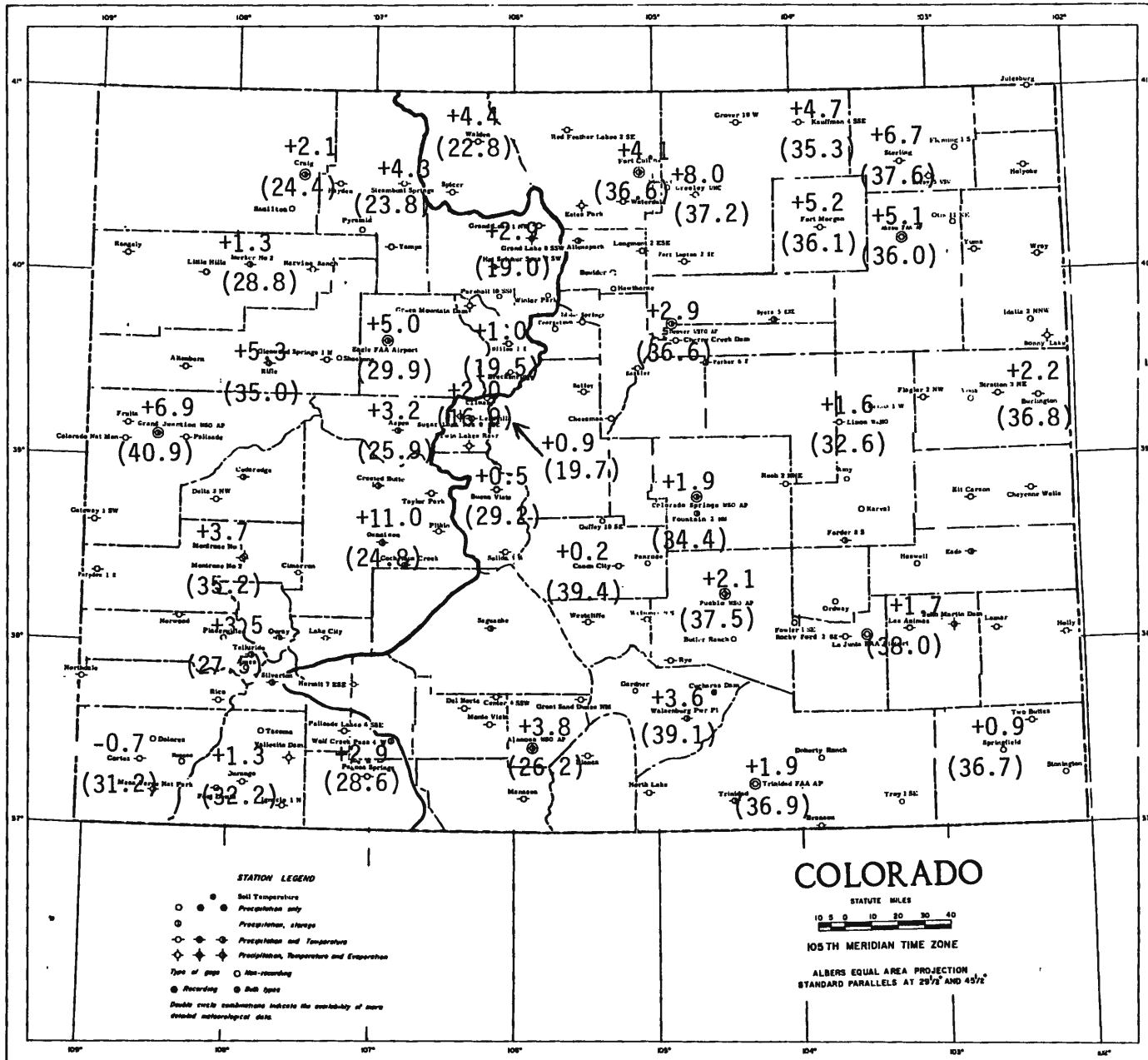


Figure 6. February 1983 Heating Degree Days as a percent above or below February 1982.

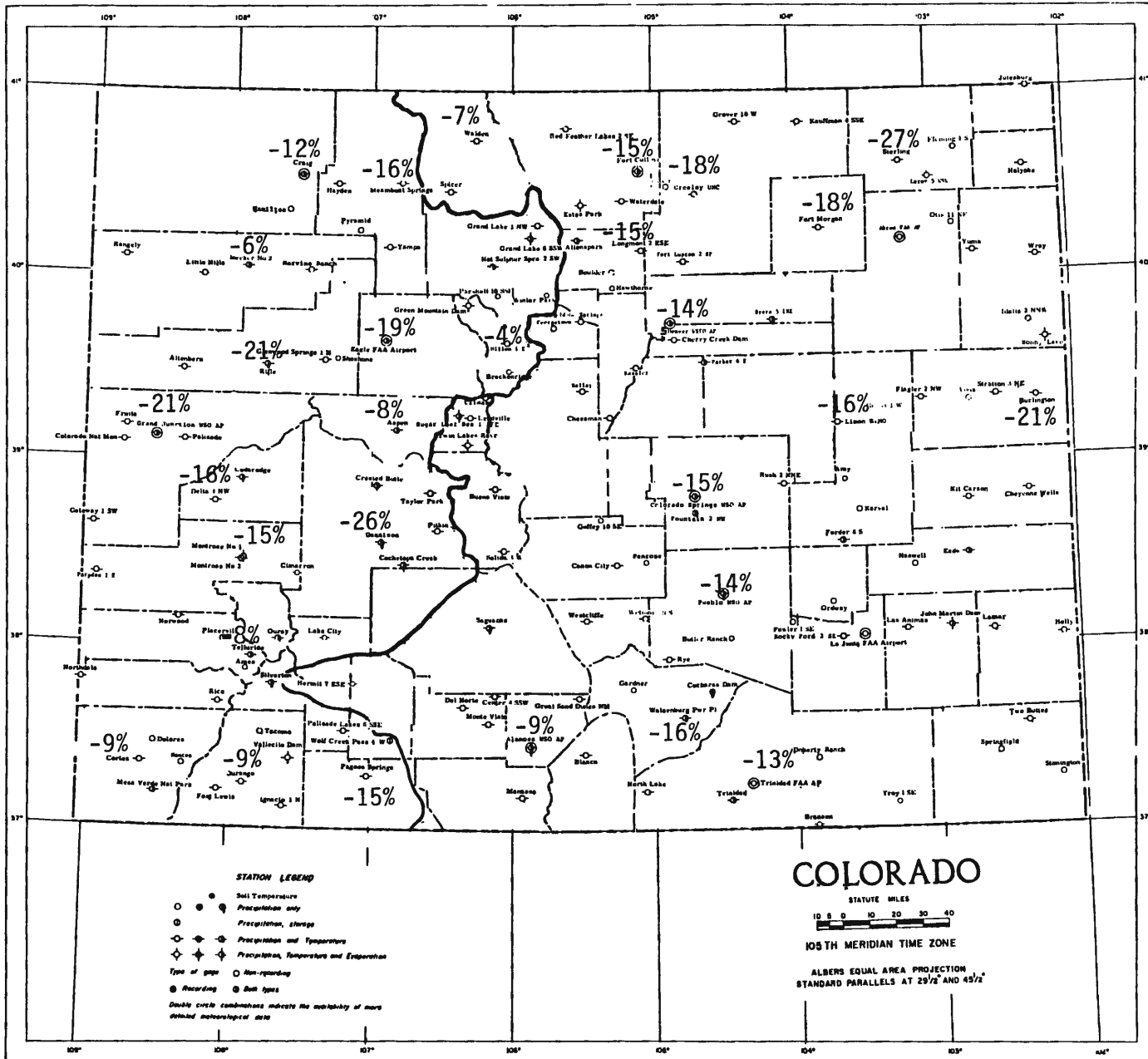


Table 1. Colorado Heating Degree Day Data through February 1983.

		JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	ANNUAL		JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	ANNUAL	
Alamosa	average	55	96	294	648	1053	1420	1482	1182	1054	714	440	171	8609	Greeley	average	0	5	153	465	870	1147	1256	991	911	528	253	60	6639
	1981-82	14	108	254	656	904	1366	1457	1192	977	736	508	230	8402		1981-82	5	9	31	459	651	1014	1170	942	721	511	275	82	5870
	1982-83	59	47	274	714	1016	1361	1380	1080							1982-83	5	0	154	478	888	1075	988	770					
Aspen	average	113	161	345	654	1026	1324	1392	1176	1144	792	530	291	8948	Gunnison	average	103	169	384	704	1110	1538	1686	1397	1246	789	533	282	9941
	1981-82	98	147	298	721	916	1279	1408	1190	1079	897	609	366	9008		1981-82	63	165	328	709	977	1354	1693	1517	1093	785	564	379	9628
	1982-83	148	119	362	808	1105	1326	1301	1095							1982-83	132	89	374	778	1146	1394	1379	1118					
Boulder	average	6	0	139	367	690	905	992	826	809	482	236	88	5540	Lamar	average	0	0	57	320	741	1032	1107	854	766	377	129	19	5402
	1981-82	4	14	36	444	562	866	964	818	649	440	279	107	5183		1981-82	0	0	27	287	575	963	1076	988	615	364	117	22	5034
	1982-83	4	0	154	442	769	913									1982-83	0	0	41	317	744	999	1736						
Burlington	average	0	0	102	363	741	1011	1085	882	828	462	210	54	5738	Limon	average	8	6	144	448	834	1070	1156	960	936	570	299	100	6531
	1981-82	10	7	25	377	601	940	1155	990	727	499	213	78	5622		1981-82	6	26	83	516	704	1071	1244	1066	850	660	363	176	6765
	1982-83	0	5	99	405	618	999	1006	784							1982-83	18	5	184	539	936	1124	1077	898					
Canon City	average	0	0	57	285	600	806	877	728	713	402	158	34	4660	Longmont	average	0	7	155	457	828	1076	1184	952	902	537	269	92	6459
	1981-82	2	9	35	399	495	761	829	711	829	402	253	84	---		1981-82	5	12	38	481	652	979	1156	952	730	485	280	98	5868
	1982-83	3	6	109	391	745	890									1982-83	7	0	164	517	894	1087	1001	809					
Colorado Springs	average	9	13	155	456	825	1054	1128	944	921	564	301	103	6473	Meeker	average	28	56	261	564	927	1240	1345	1086	998	651	394	164	7714
	1981-82	5	30	70	433	640	993	1095	1001	827	571	374	163	6202		1981-82	8	72	160	572	847	1098	1254	1080	884	731	442	207	7355
	1982-83	8	11	198	532	880	1084	1001	851							1982-83	33	7	245	657	998	1225	1157	1010					
Cortez	average	0	10	110	425	807	1104	1156	904	834	534	274	81	6239	Montrose	average	0	9	129	435	828	1132	1197	935	834	510	245	71	6325
	1981-82	2	7	83	499	726	1076	1230	1037	825	609	362	109	6565		1981-82	0	8	38	466	714	1074	1185	976	727	525	262	47	6022
	1982-83	17	5	132	606	856	1148	1168	939							1982-83	4	2	111	556	846	1104	1094	828					
Craig	average	32	58	275	608	996	1342	1479	1193	1094	687	419	193	8376	Pagosa Springs	average	95	114	291	611	981	1311	1401	1140	1048	711	481	233	8417
	1981-82	19	35	149	697	901	1260	1529	1277	987	838	506	209	8407		1981-82	19	102	244	642	856	1265	1525	1197	1006	708	495	269	8328
	1982-83	37	5	271	752	1116	1361	1305	1130							1982-83	76	29	253	732	938	1338	1274	1013					
Delta	average	0	0	94	394	813	1135	1197	890	753	429	167	31	5903	Pueblo	average	0	0	55	335	726	992	1082	848	775	405	148	28	5394
	1981-82	0	1	17	375	673	966	1123	894	625	451	163	12	5300		1981-82	0	0	22	272	554	937	1046	888	582	358	151	21	4825
	1982-83	2	4	81	496	1043	1040	753								1982-83	0	0	63	427	794	1010	974	833					
Denver	average	0	0	120	408	768	1004	1088	902	868	525	253	80	6016	Rifle	average	7	22	167	481	661	1200	1296	997	859	537	283	85	5394
	1981-82	0	12	19	375	570	898	1070	918	733	522	306	92	5515		1981-82	0	42	513	760	1173	1342	1056	774	603	323	105	---	
	1982-83	3	0	151	487	875	1050	1017	789							1982-83	8	3	150	596	871	1129	1082	833					
Dillon	average	291	341	519	809	1173	1442	1519	1319	1321	966	701	453	10854	Salida	average	28	69	240	536	854	1094	1132	958	905	588	369	139	6910
	1981-82	243	302	448	835	1027	1379	1520	1323	1238	1058	746	507	10626		1981-82	22	67	168	537	1033	1179	1096	---	---	---	---	---	---
	1982-83	318	253	511	959	1235	1450	1418	1265							1982-83	--	--	---	---	---	---	---						
Durango	average	20	37	198	502	843	1147	1212	958	829	597	375	161	6930	Steamboat Springs	average	116	159	384	691	1086	1451	1553	1277	1190	789	521	306	9523
	1981-82	9	22	125	531	764	1047	1311	1004	845	599	383	145	6785		1981-82	83	141	257	734	973	1340	1502	1361	1069	878	589	380	9307
	1982-83	24	6	175	614	874	1197	1130	909							1982-83	146	80	368	791	1183	1482	1446	1146					
Eagle	average	43	79	285	626	1023	1386	1457	1168	1051	693	425	190	8426	Sterling	average	0	6	158	459	849	1150	1249	986	927	522	256	76	6638
	1981-82	6	54	155	632	889	1244	1451	1206	904	753	479	234	8007		1981-82	8	20	79	448	755	1085	1321	1042	832	595	337	122	6644
	1982-83	54	21	257	720	1059	1350	1273	974							1982-83	3	3	154	518	933	1098	1046	762					
Fort Collins	average	7	12	175	477	834	1076	1184	960	918	558	297	101	6599	Telluride	average	185	229	399	676	1017	1290	1333	1140	1147	825	583	345	9169
	1981-82	8	8	42	487	661	987	1142	926	741	527	295	115	5939		1981-82	117	177	320	707	891	1209	1323	1131	1062	815	582	325	8659
	1982-83	4	0	178	509	925	1082	968	787							1982-83	139	140	364	746	1022	1265	1195	1042					
Fort Morgan	average	0	0	132	439	849	1141	1262	986	899	509	233	61	6511	Trinidad	average	0	0	81	364	732	980	1054	868	822	471	212	58	5642
	1981-82	3	11	37	421	650	1035	1199	981	742	516	234	81	5910		1981-82	0	15	39	316	524	849	935	897	624	428	211	49	4887
	1982-83	3	3	123	492	895	1086	1050	804							1982-83	0	0	66	367	705	949	956	779					
Grand Junction	average	0	0	60	324	756	1101	1190	879	738	404	133	20	5606	Walden	average	197	270	489	803	1149	1438	1538	1313	1280	891	626	363	10357
	1981-82	0	0	12	439	696	1039	1203	841	581	405	136	6	5358		1981-82	143	241	357	831	1007	1314	1444	1262	1114	958	703	412	9786
	1982-83	2	0	61	397	704																							

COLORADO CLIMATE -- MARCH 1983

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

Precipitation in March was unusually heavy across most of Colorado as many storm systems affected the state. Warm weather during the first two weeks of March brought out the early spring flowers. But winter made a chilling return for the remainder of the month, burying thoughts of spring under a heavy blanket of snow.

Significant Highlights -- March

<u>Date</u>	<u>Event</u>
1-3	Warm and dry. Daytime temperatures mostly in the 60's east of mountains. Denver and Colorado Springs 68°F, Greeley 70°F, Burlington 72°F, and Sterling 73°F on the 2nd, their warmest temperatures for the month. A few showers in southwest Colorado.
4-6	Major spring storm system moved across Colorado. First thunder of the year heard in some locations. Precipitation fell statewide with heaviest amounts from the Northern and Central Mountains eastward across the plains. 1 to 2 inch totals common with more than 3" of water equivalent from Denver southwestward into the foothills. More than a foot of wet snow in these areas. Sedalia reported 3.27" total precipitation with 20" of snow. Berthoud Pass received about 30" of snow from the system. Temperatures stayed near or a little above average.
7-9	Large high pressure ridge aloft west of Colorado. A few snow showers across northern Colorado on the 8th. Akron received 4" snow on the 8th. Temperatures warm west of mountains, seasonal east.
10-13	Very warm period. Durango hit 64° on the 10th, Grand Junction 70°F on the 11th. Dillon reached 52° on the 11th. East of the mountains daytime temperatures rose into the 60's with a few local 70's. Canon City, for example, reached 70° or above on the 11th-13th. A minor storm system north of the state triggered a few scattered rain and snow showers in western Colorado on the 12th.
14	Storm system began to develop west of Colorado. Locally heavy precipitation with lightning and thunder began on the Western Slope and spread eastward. Grand Junction received 0.96" of rain during the late afternoon and evening. Mild temperatures.

<u>Date</u>	<u>Event</u>
15-16	Major winter storm developed over the state. Sharply colder. Precipitation statewide, rain changing to snow east. Heaviest precipitation fell along the eastern foothills southeastward across the plains. Examples of two-day precipitation totals include 0.98" at Las Animas, 0.93" (5" snow) at Pueblo, 1.64" (11.5" snow) at Boulder. More than 2 feet of snow were reported in several foothill locations.
17-20	A new slow moving winter storm moved across the western U.S. Steady upslope winds across eastern Colorado produced persistent light snow. A period of heavy precipitation in southwest Colorado occurred on the 18th and 19th. Cedaredge received 1.25" precipitation with 8" snow. Wolf Creek Pass totalled 35" new snow for the period including 21" on the 18th-19th.
21	Clearing and very cold. Practically the entire state recorded their lowest temperatures of the month. Denver +13°F, Colorado Springs +6°F, Limon +2°F, Dillon -7°F. Crested Butte dipped to -20° while Taylor Park Reservoir took honors once again with a frigid -36°.
22-27	Cold and unsettled period. Some precipitation fell each day, especially in the mountains. Berthoud Pass received another 17" of new snow. Strong low pressure area formed in eastern Colorado on the 25th, but the heaviest precipitation fell east and north of the state.
28-30	Continued unsettled but becoming warmer. Scattered precipitation continued in the mountains. Strong winds and warm temperatures east of the mountains on the 30th rapidly melted the snow. Winds in excess of 80 mph were noted in preferred locations along the Front Range.
31	Another strong low pressure area formed over Colorado and dropped quickly into Oklahoma. Temperature soared to 79° at Rocky Ford (warmest in the state for the month) before cold, blustery winds moved in. Precipitation from this storm was scattered and relatively light.

Precipitation Summary

Precipitation totals and percents of average for March are shown in Figures 1 and 2. It was an unusually wet and snowy month over the entire state. Many new record monthly precipitation totals were set including 3.34" at Estes Park, 3.64" at Sedgwick, 4.56" at Denver, and 5.64" at Kassler. The heaviest montly total was 7.11" measured at the Inter Canyon station near Morrison.

Monthly snowfall totals ranged from about 12 inches in southeastern Colorado to 2 to 3 feet near the eastern base of the foothills to more than 8 feet in some high mountain areas. Examples of monthly snowfall totals include: 1.5" at Grand Junction, 7" at Rocky Ford, 20" at Akron, 30.5" at Denver, 42" at Ouray, 43" at Parker, 52" near Nederland, and 89.5" at Berthoud Pass.

For the state as a whole, March precipitation was about double the average (Figure 2). The wettest areas, compared to average, were the southern, western, and northern slopes of the San Juans, portions of the Gunnison drainage and most of eastern Colorado. Nearly 3 times the average March precipitation fell in the La Junta - Pueblo area. Totals in much of the South Platte Drainage from Fort Morgan upstream into the foothills were more than 4 times greater than normal.

Remarkably, a few dry areas were still noted. Precipitation in the vicinity of Creede and Leadville was only about 70% of average.

Water-Year Precipitation to Date

Precipitation for the first half of the 1983 water year is now near or above average in most of Colorado (Figure 3). The only remaining dry areas are the Upper Arkansas drainage, the Gunnison drainage, and the western half of the San Luis Valley. Even these areas have improved greatly during the past month. Reservoir storage and snowpack is above average for this time of year for the state as a whole. State water supplies for this coming summer should be excellent.

Temperature Summary

The first half of March was warmer than average in all parts of Colorado. The second half of the month was unusually cold, especially east of the mountains. For the month as a whole, temperatures ended up above average in the west and fairly close to average in the east (Figure 4). Steamboat Springs and Gunnison were the warmest locations in Colorado compared to average, 4.9 and 7.3 degrees Fahrenheit above average, respectively. East of the mountains monthly temperatures ranged from about two degrees below average at Burlington and Denver to more than one degree above average at Limon, Fort Morgan, and Sterling.

Heating Degree Days

Heating degree day information for selected Colorado cities is given in Figures 5 and 6 and in Table 1. Heating degree day totals ranged from 1301 at Leadville to 586 at Grand Junction. Degree day totals were close to average across eastern Colorado from Boulder southward and eastward. Elsewhere, totals were mostly 10 to 20 percent less than normal indicating the warm March weather. Heating degree day totals were considerably higher than last year. In eastern Colorado, especially along the Front Range. This indicates a greater demand for energy to heat homes, schools, and businesses than last year. Throughout the rest of the state degree day totals were similar to March 1982.

Figure 1. March 1983 precipitation amounts (inches).

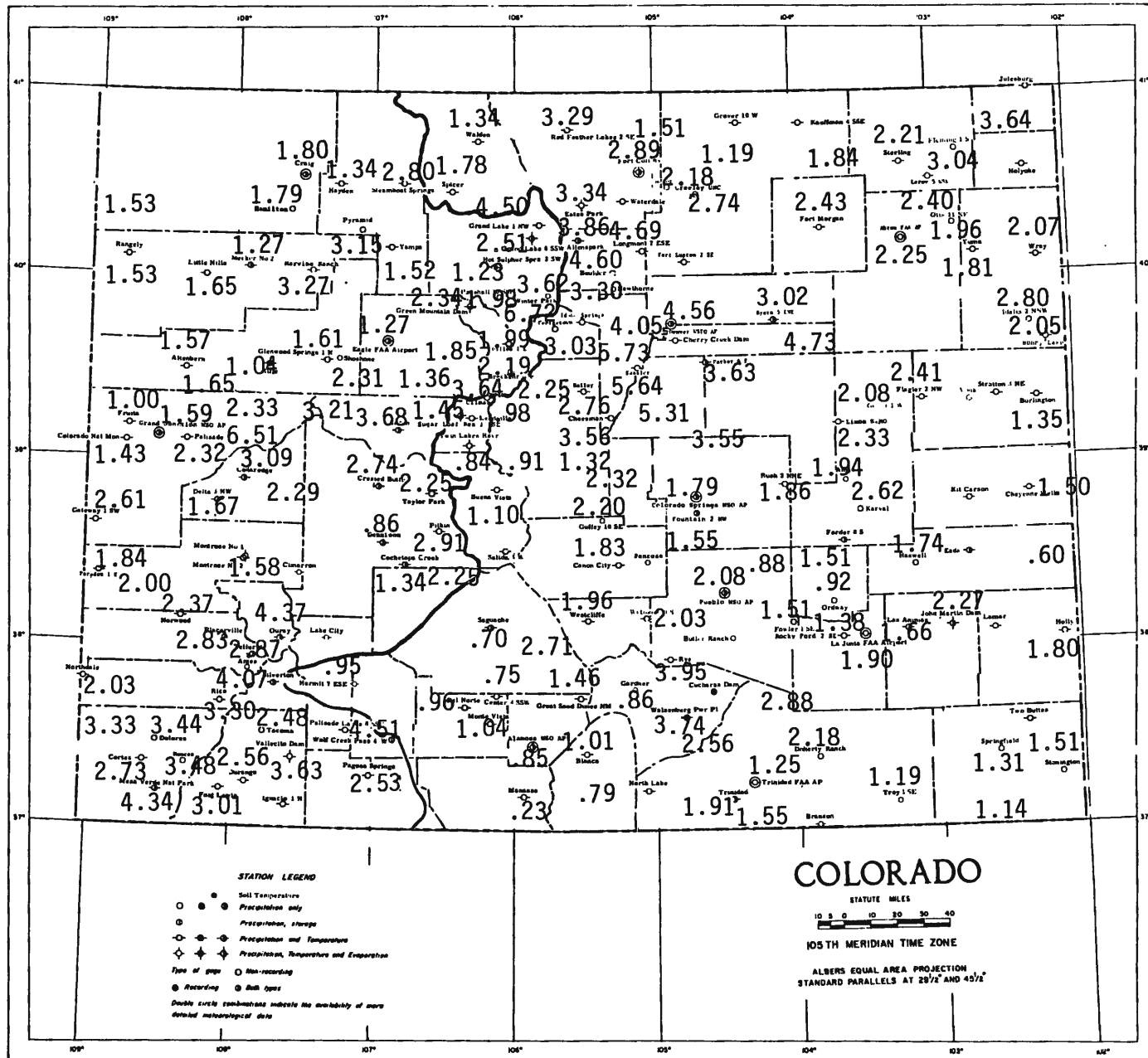


Figure 2. Precipitation for March 1983 as a percent of the 1961-1980 average.

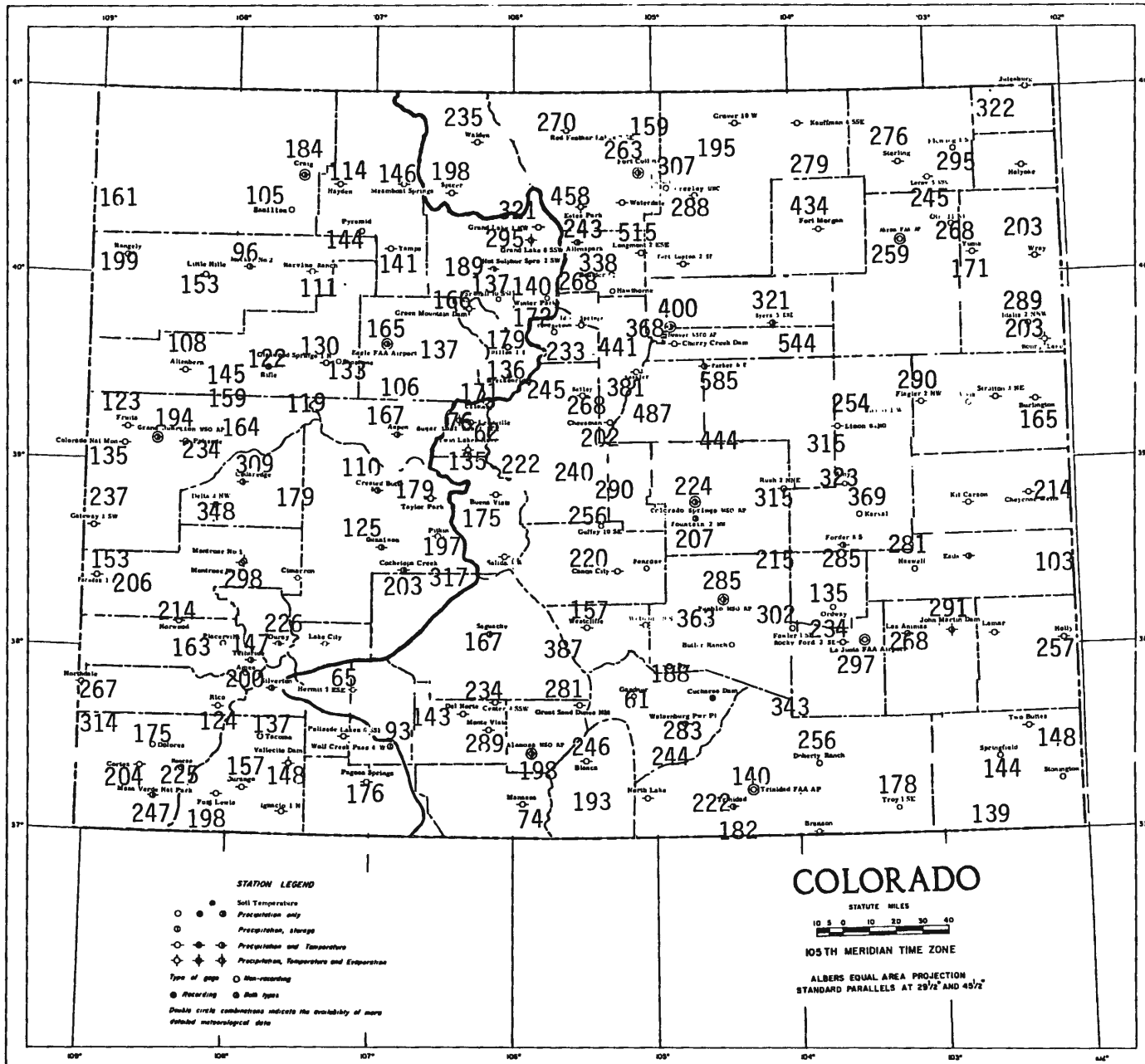


Figure 3. Precipitation for October 1982 through March 1983 as a percent of the 1961-1980 average.

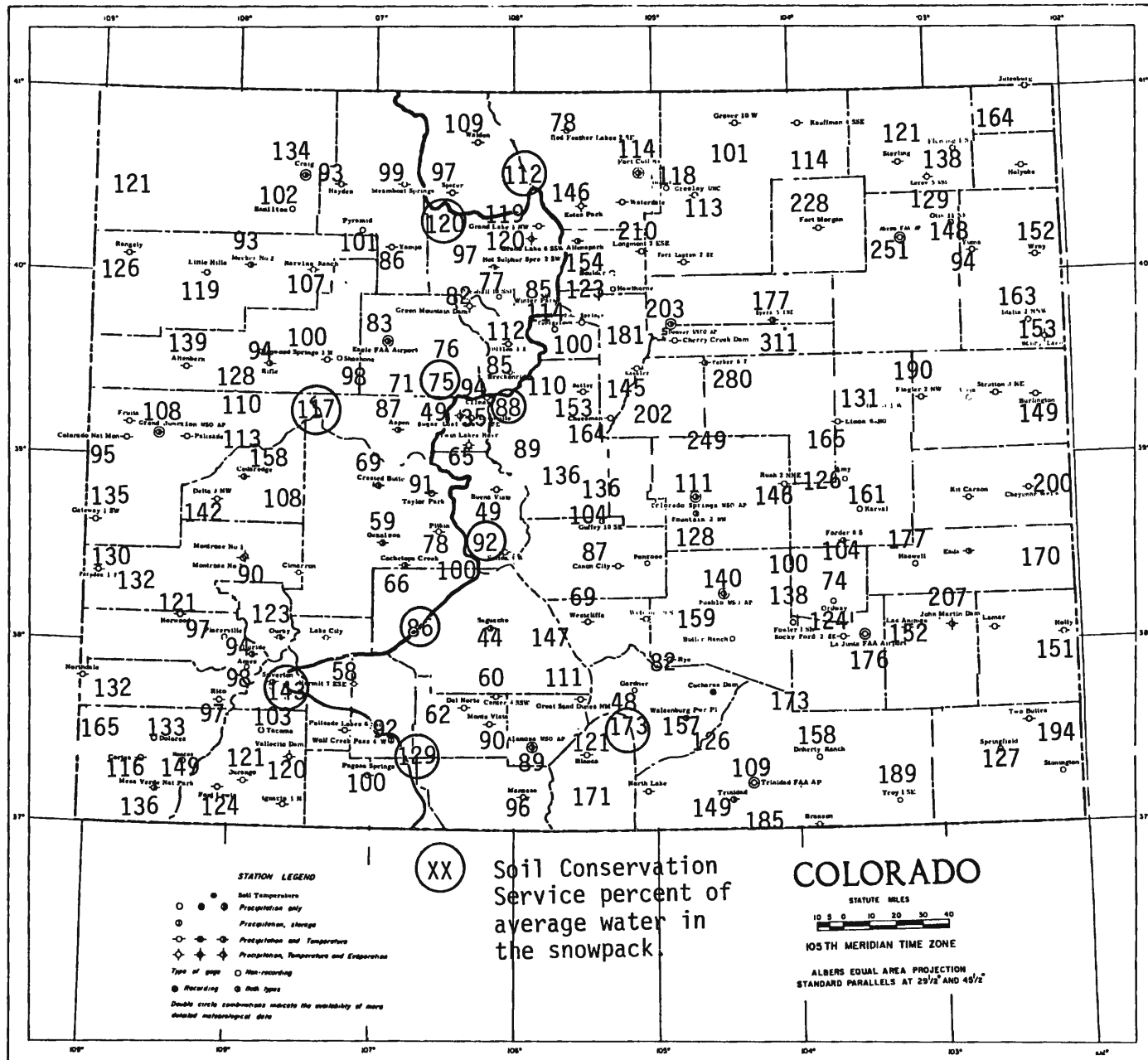


Figure 4. Temperatures for March 1983 in degrees Fahrenheit (in parentheses) and departures from the 1961-1980 average.

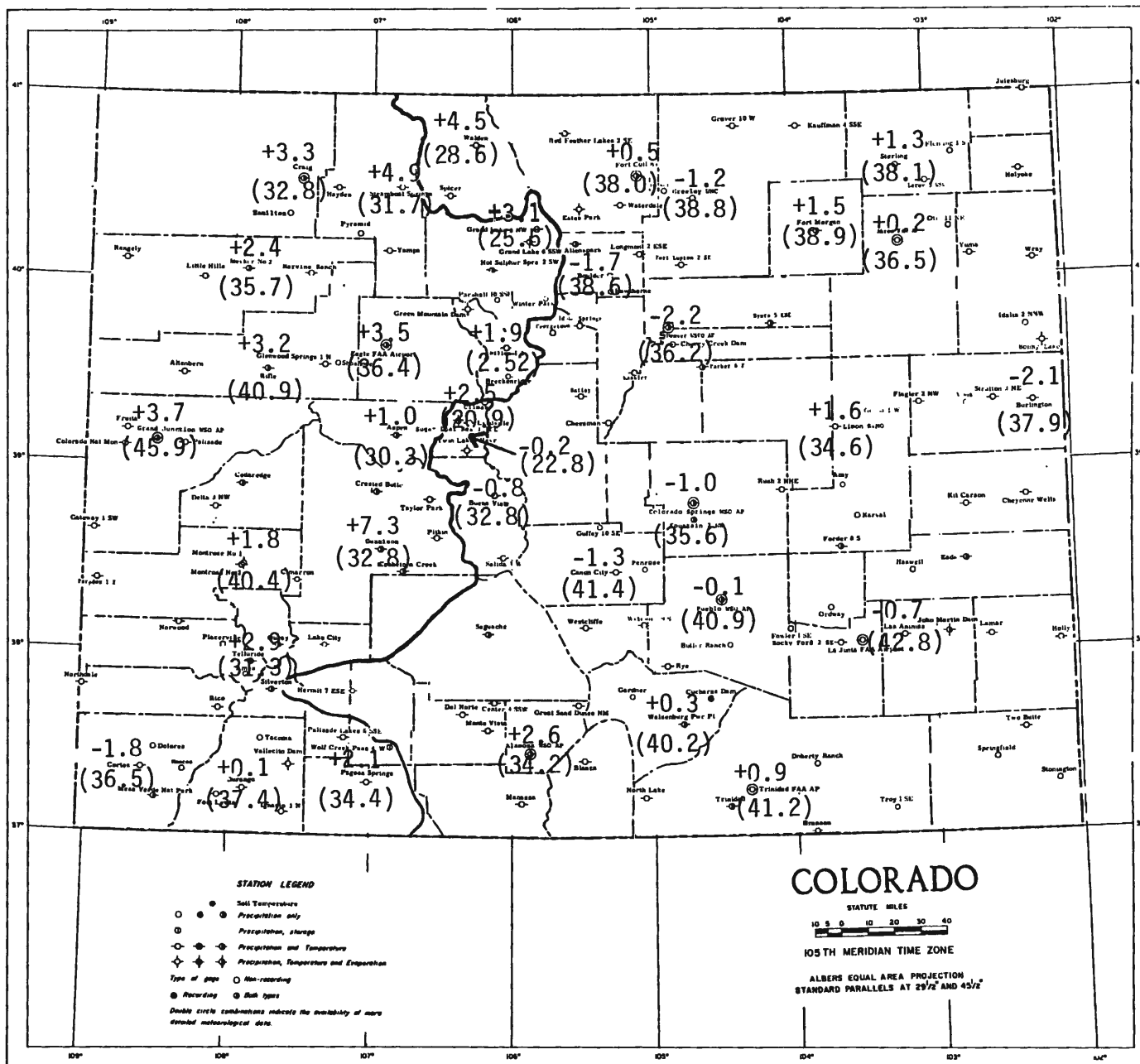


Figure 6. March 1983 Heating Degree Days as a percent above or below March 1982.

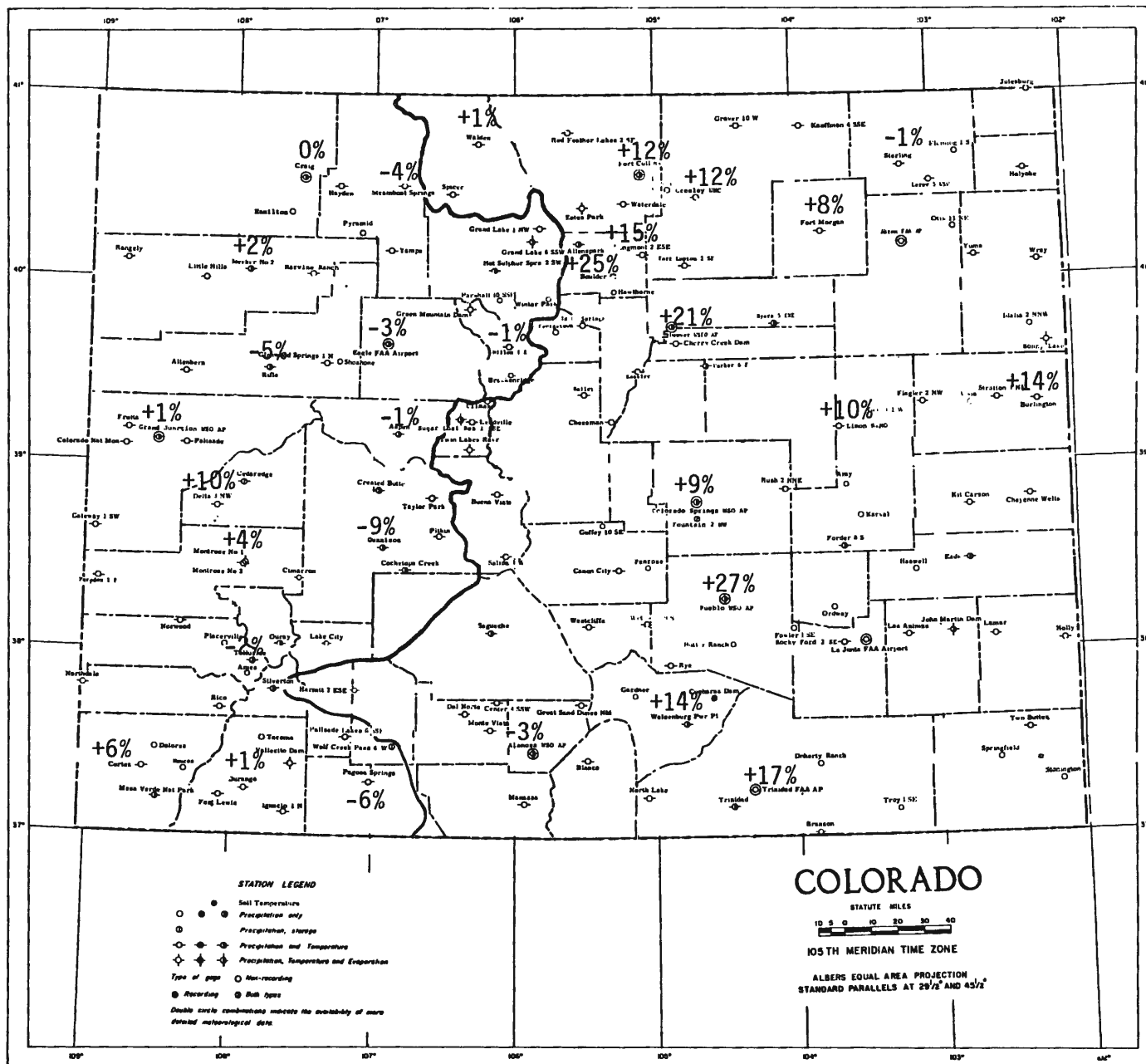


Table 1. Colorado Heating Degree Day Data through March 1983.

		JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	ANNUAL		JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	ANNUAL		
Alamosa	average	55	96	294	648	1053	1420	1482	1182	1054	714	440	171	8609	Greeley	average	0	5	153	465	870	1147	1256	991	911	528	253	60	6639	
	1981-82	14	108	254	656	904	1366	1457	1192	977	736	508	230	8402		1981-82	5	9	31	459	651	1014	1170	942	721	511	275	82	5870	
	1982-83	59	47	274	714	1016	1361	1380	1080	945						1982-83	5	0	154	478	888	1075	988	770	806					
Aspen	average	113	161	345	654	1026	1324	1392	1176	1144	792	530	291	8948	Gunnison	average	103	169	384	704	1110	1538	1686	1397	1246	789	533	282	9941	
	1981-82	98	147	298	721	916	1279	1408	1190	1079	897	609	366	9008		1981-82	63	165	328	709	977	1354	1693	1517	1093	786	564	379	9628	
	1982-83	148	119	362	808	1105	1326	1301	1095	1066						1982-83	132	89	374	778	1146	1394	1379	1118	990					
Boulder	average	6	0	139	367	690	905	992	826	809	482	236	88	5540	Lamar	average	0	0	57	320	741	1032	1107	854	766	377	129	19	5402	
	1981-82	4	14	36	444	562	866	964	818	649	440	279	107	5183		1981-82	0	0	27	287	575	963	1076	988	615	364	117	22	5034	
	1982-83	4	0	154	442	769	913		811							1982-83	0	0	41	317	744	999	1036	770						
Burlington	average	0	0	102	363	741	1011	1085	882	828	462	210	54	5738	Limon	average	8	6	144	448	834	1070	1156	960	936	570	299	100	6531	
	1981-82	10	7	25	377	601	940	1155	990	727	499	213	78	5622		1981-82	6	26	83	516	704	1071	1244	1066	850	660	363	176	6765	
	1982-83	0	5	99	405	818	999	1006	784	832						1982-83	18	5	184	539	936	1124	1077	898	935					
Canon City	average	0	0	57	285	600	806	877	728	713	402	158	34	4660	Longmont	average	0	7	155	457	828	1076	1184	952	902	537	269	92	6459	
	1981-82	2	9	35	495	761	961	827	713	402	158	34	4660	1981-82		5	12	38	481	652	979	1156	952	730	485	280	98	5868		
	1982-83	3	6	109	391	745	890	829	711	726						1982-83	7	0	164	517	894	1087	1001	809	836					
Colorado Springs	average	9	13	155	456	825	1054	1128	944	921	564	301	103	6473	Meeker	average	28	56	261	564	927	1240	1345	1086	998	651	394	164	7714	
	1981-82	5	30	70	433	640	993	1095	1001	827	571	374	163	6202		1981-82	8	72	160	572	847	1098	1254	1080	884	731	442	207	7355	
	1982-83	8	11	198	532	880	1084	1001	851	904						1982-83	33	7	245	657	998	1225	1157	1010	901					
Cortez	average	0	10	110	425	807	1104	1156	904	834	534	274	81	6239	Montrose	average	0	9	129	435	828	1132	1197	935	834	510	245	71	6325	
	1981-82	2	7	83	499	726	1076	1230	1037	825	609	362	109	6565		1981-82	0	8	38	466	714	1074	1185	976	727	525	262	47	6022	
	1982-83	17	5	132	606	856	1148	1168	939	878						1982-83	4	2	111	556	846	1104	1094	828	759					
Craig	average	32	58	275	608	996	1342	1479	1193	1094	687	419	193	8376	Pagosa Springs	average	95	114	291	611	981	1311	1401	1140	1048	711	481	233	8417	
	1981-82	19	35	149	697	901	1260	1529	1277	987	838	506	209	8407		1981-82	19	102	244	642	856	1265	1525	1197	1006	708	495	269	8328	
	1982-83	37	5	271	752	1116	1361	1365	1130	989						1982-83	76	29	253	732	938	1338	1274	1013	943					
Delta	average	0	0	94	394	813	1135	1197	890	753	429	167	31	5903	Pueblo	average	0	0	55	335	726	992	1082	848	775	405	148	28	5394	
	1981-82	0	1	17	375	673	966	1123	894	625	451	163	12	5300		1981-82	0	0	22	272	554	937	1046	882	582	358	151	21	4825	
	1982-83	2	4	81	496	1043	1040	753	686							1982-83	0	0	63	427	794	1010	974	833	740					
Denver	average	0	0	120	408	768	1004	1088	902	868	525	253	80	6016	Rifle	average	7	22	167	481	861	1200	1296	997	859	537	283	85	5394	
	1981-82	0	12	19	375	570	898	1070	918	733	522	306	92	5515		1981-82	0	42	513	760	1173	1342	1056	774	603	323	105	---		
	1982-83	3	0	151	487	875	1050	1017	789	885						1982-83	8	3	150	596	871	1129	1082	833	738					
Dillon	average	291	341	519	809	1173	1442	1519	1319	1321	966	701	453	10854	Salida	average	28	69	240	536	854	1094	1132	958	905	588	369	139	6910	
	1981-82	243	302	448	835	1027	1379	1520	1323	1238	1058	746	507	10626		1981-82	22	67	168	537	854	1033	1179	1096	---	---	---	---	---	---
	1982-83	318	253	511	959	1235	1450	1418	1265	1227						1982-83	--	--	---	---	---	---	---	---	---	---	---	---	---	---
Durango	average	20	37	198	502	843	1147	1212	958	880	597	375	161	6930	Steamboat Springs	average	116	159	384	691	1086	1451	1553	1277	1190	789	521	306	9523	
	1981-82	9	22	125	531	764	1047	1311	1004	845	599	383	145	6785		1981-82	83	141	257	734	973	1340	1502	1361	1069	878	589	380	9307	
	1982-83	24	6	175	614	874	1197	1130	909	850						1982-83	146	80	368	791	1183	1482	1446	1146	1024					
Eagle	average	43	79	285	626	1023	1386	1457	1168	1051	693	425	190	8426	Sterling	average	0	6	158	459	849	1150	1249	986	927	522	256	76	6638	
	1981-82	6	54	155	632	889	1244	1451	1206	904	753	479	234	8007		1981-82	8	20	79	448	755	1085	1321	1042	832	595	337	122	6644	
	1982-83	54	21	257	720	1059	1350	1273	974	880						1982-83	3	3	154	518	933	1098	1046	762	827					
Fort Collins	average	7	12	175	477	834	1076	1184	960	918	558	297	101	6599	Telluride	average	185	229	399	676	1017	1290	1333	1140	1147	825	583	345	9169	
	1981-82	8	8	42	487	661	987	1142	926	741	527	295	115	5939		1981-82	117	177	320	707	891	1209	1323	1131	1062	815	582	325	8659	
	1982-83	4	0	178	509	925	1082	968	787	830						1982-83	139	140	364	746	1022	1265	1195	1042	1036					
Fort Morgan	average	0	0	132	439	849	1141	1262	986	899	509	233	61	6511	Trinidad	average	0	0	81	364	732	980	1054	868	822	471	212	58	5642	
	1981-82	3	11	37	421	650	1035	1199	981	742	516	234	81	5910		1981-82	0	15	39	316	524	849	935	897	624	428	211	49	4887	
	1982-83	3	3	123	492	895	1086	1050	804	798						1982-83	0	0	66	367	705	949	956	779	730					
Grand Junction	average	0	0	60	324	756	1101	1190	879	738	404	133	20	5606	Walden	average	197	270	489	803	1149	1438	1538	1313	1280	891	626	363	10357	
	1981-82	0	0	12	439	696	1039	1203	841	581	405	136																		

COLORADO CLIMATE -- APRIL 1983

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

Winter-like weather held a firm grip on Colorado for the first half of April with plenty of snow and cold. Despite some warm days later in the month, April was still much colder than average. The majority of the state was also wetter than normal.

Significant Highlights -- April

<u>Date</u>	<u>Event</u>
1	Windy and colder as deep low pressure area moved into the Midwest. Scattered snowshowers, mostly light except in higher mountains.
2-9	Very cold wintry period. New major storm system approached from the West Coast 2nd and 3rd and stalled SW of Colorado. Snow developed over most of the state on the 3rd, heaviest just east of the mountains. Precipitation ended west of mountains 4th and 5th, but continued on the east side -- very heavy in some foothills locations. Fort Collins totalled 21" of snow 3rd-5th. Unseasonably cold temperatures were reported with some new records. Below freezing readings persisted 4-7th across much of the state. Denver and Akron each dropped to +7°F on the 6th. Walsenburg dipped to 5° that morning and Dillon hit -12°F. The coldest temperature in the state occurred at Taylor Park Dam as usual, -28°F on the 8th. Gradually clearing with moderating temperatures 8-9th. Still some lingering mountain snows.
10	Dry and seasonably mild in advance of still another major winter storm system.
11-14	Another winter siege as deep low pressure area formed over southeastern Colorado and moved northeast. Scattered thunderstorms developed on the 11th which gave way to snow on the 12th across much of northern Colorado. Heavy precipitation across the northeastern plains on the 12th with blizzard-like conditions. Akron airport received 1.09" precipitation on the 12th which included 4" of snow.
15-20	Dry, sunny, with steady warming trend. First really warm weather of the month. Seventies across most of the Eastern

Plains on the 18th and 20th. Some showers in western Colorado 18-19th with high elevation snows.

- 21-22 Upper level storm system with small surface low moved across southern Colorado. Most of the state received some precipitation but areas of heavy snows in some mountain areas with heavy showers especially in southeastern Colorado. Berthoud Pass received 21" of new snow from the storm. Las Animas reported 1.55" rain in 24 hours on the 22nd. La Junta received a total of 2.35" of rain from the storm and a station southwest of La Junta totalled 2.80".
- 23-25 Dry and warm -- warmest weather since last fall. Walden and Ouray reached 62°F on the 24th. Grand Junction hit 79°. The warmest temperature recorded was the 85° reading at Las Animas on the 25th, the warmest in the state in April.
- 26-30 Steady southwesterly flow of very moist air into Colorado. Heavy mountain snows. Scattered showers and thunderstorms at lower elevations. Southern counties remained dry. Fort Morgan received nearly 2" of rain from these scattered storms. The Avon airport near Vail recorded 1.90" precipitation. Berthoud Pass took the prize with 2.32" of precipitation for the period, including 30 inches of snow. The Berthoud Pass snowdepth reached 100" on the 29th, the greatest snowdepth since 1957.

Precipitation Summary

Precipitation totals and percents of average for April are shown in Figures 1 and 2. There was plenty of local variation, but on the whole the state was wetter than average. The wettest areas compared to average were the northern Front Range region eastward toward Nebraska, southeastern Colorado from Trinidad and Pueblo eastward to the Kansas border, and the Colorado River Valley upstream from Grand Junction to the Continental Divide. Berthoud Pass was the wettest reporting station in the state with 7.42" of water equivalent precipitation for the month (93" snow) 174 percent of average. The Timpas weather station in southeastern Colorado was the wettest site east of the mountains with a total of 4.56" for the month, almost 500 percent of average.

A few drier than average areas were reported. An area from Buena Vista eastward to Limon received only about two-thirds the average April precipitation. Portions of the Yampa Valley, the upper Gunnison

drainage, the San Luis Valley and upper Rio Grande drainage were also drier than average. The Blanca station east of Alamosa received only 0.13" of precipitation for the month, 35 percent of average.

Water-Year Precipitation to Date

Accumulated precipitation for the main October through April winter season is above average across most of Colorado (Figure 3). Only limited areas in the upper Arkansas Valley, the San Luis Valley, and much of the Gunnison Valley remain drier than average. With the help of excellent snowpack, water supplies for the coming summer months will be adequate.

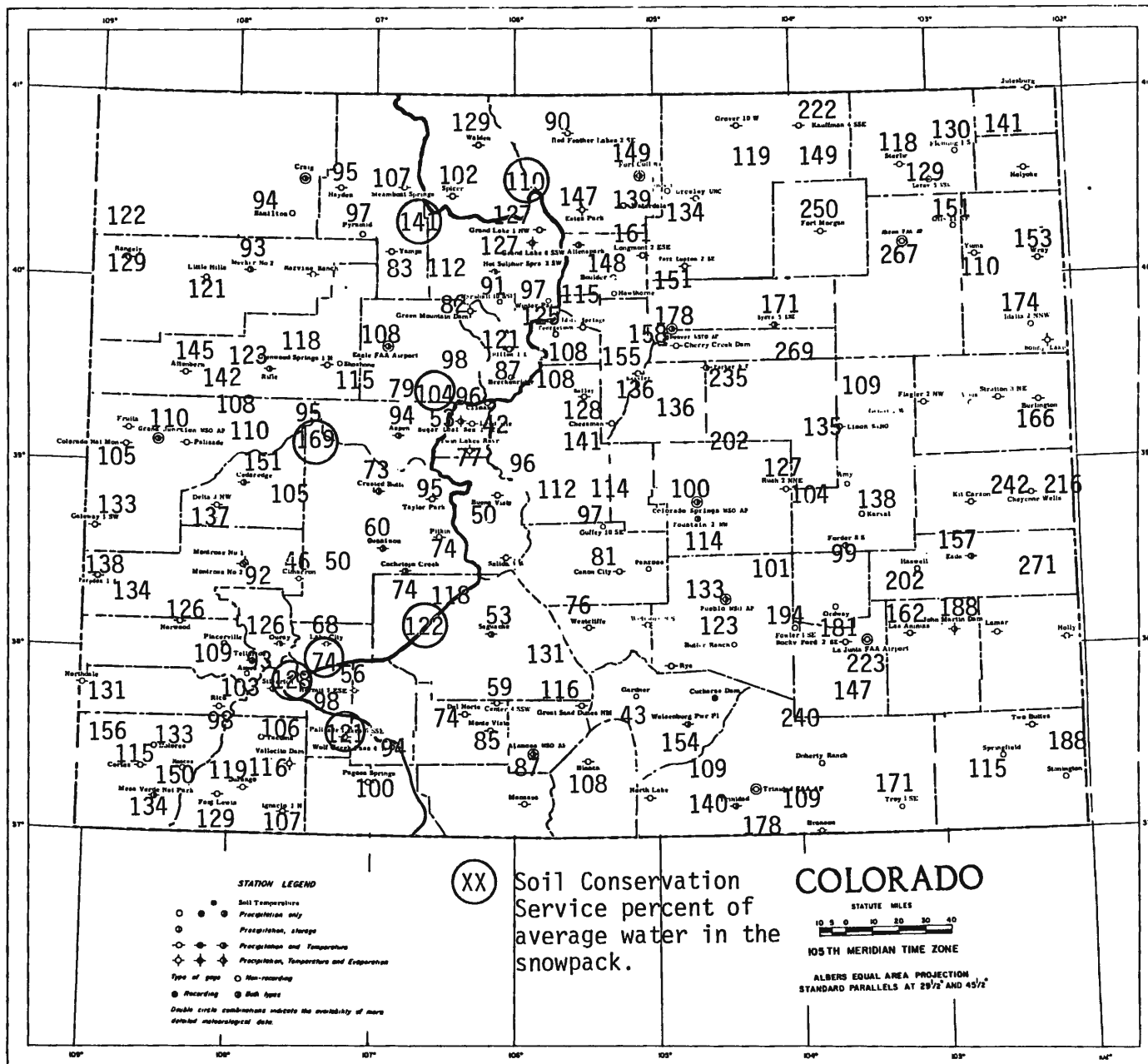
Temperature Summary

The entire state was much cooler than average in April (Figure 4). Temperatures east of the mountains were mostly 5 to 7 degrees Fahrenheit colder than normal for the month. West of the Divide temperatures were mostly 3 to 7 degrees below average. For the state as a whole, this was the coldest April since 1957.

Heating Degree Days

With the chilly April temperatures, considerable energy was still needed to heat homes, schools, and businesses. The heating degree day information in Figures 5 and 6 and in Table 1 really helps show this. East of the mountains, heating degree day totals were mostly 30 to 40% more than average. Totals were generally 15 to 25% above average in the western half of the state. When comparing to April 1982 (Figure 6), totals ranged from just 1% more than last year at Craig to 57% more than a year ago at Pueblo. Hence, fuel bills for heating in April would be expected to be higher than a year ago, especially east of the mountains.

Figure 3. Precipitation for October 1982 through April 1983 as a percent of the 1961-1980 average.



COLORADO CLIMATE -- MAY 1983

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

It was a cool and unusually wet May over most of Colorado. Heavy mountain snows and a mid-month blizzard helped make it seem more like March than May. Hot summer temperatures finally developed late in the month producing rapid mountain snow melt which quickly raised river levels to near flood stage.

Significant Highlights -- May

<u>Date</u>	<u>Event</u>
1-4	Cool and wet period as upper-level storm system crossed the state. Considerable mountain snowfall. Climax picked up more than a foot of new snow. East of the mountains only light and widely scattered precipitation occurred.
5-7	Low pressure area moved across Colorado producing briefly warmer temperatures on the 5th followed by mountain snows on the 6th with a few lower elevation showers. Clearing but cool on the 7th. Alamosa dipped to 16°F on the 7th and Taylor Park Dam experienced a -4°F reading, the coldest in the state for the month.
8-10	High pressure ridge east of Colorado with low pressure to the west. Warm, breezy and dry across the state. Temperatures soared into the 80's east of the mountains on the 9th.
11-22	Cold, wet and stormy period across most of the state. One storm quickly moved across Colorado and Wyoming on the 11th producing only light precipitation over the northern part of the state. Very cold on the 12th with many areas reporting their coldest readings of the month. Examples: Sterling and Fort Collins 29°, Burlington 31°, Springfield 32°, Grand Junction 33°. Cold upslope precipitation developed east of the mountains on the 13th. A few inches of snow fell on the 13th and 14th along the eastern foothills from Trinidad northward to Wyoming. Significant mountain snowfalls began on the 14th and 15th in advance of a very strong winter storm system which pounded the state on the 16th and 17th. Very heavy precipitation on the 16th and 17th. Example totals: Grand Junction 1.25", Fruita 1.90", Avon 2.22",

Longmont 3.17", Greeley and Boulder each totalled 2.77" in 24 hours ending on the 17th. Heavy snows and high winds were also a part of this storm. Denver received 7 inches of wind driven snow. Foothills areas such as Red Feather Lakes picked up 15" of snow. Two to three feet of new snow fell on some of the higher elevations in the Northern and Central Mountains. Wind gusts up to 70 mph accompanied the storm and helped knock out power to many Front Range communities. Subfreezing temperatures followed the storm. Denver dropped to 28°F on the 18th. Cool, showery weather continued on the 18th and 19th with another round of heavy precipitation on the 20th, this time affecting mostly southeastern Colorado. Several stations from Walsenburg and Colorado Springs eastward to Kansas received more than an inch of precipitation. Southern foothills locations received 6 to 18 inches of snow. One more round of precipitation occurred across most of Colorado on the 22nd as an upper air disturbance crossed over the area.

- 23-28 Large high pressure ridge over western U.S. brought dry and very warm weather to Colorado. Temperatures rose into the 80's over much of the state with 60's and 70's over the mountains. Rapid snowmelt began to cause immediate flood threats in several parts of the state. Palisade, Grand Junction, a station near Campo, and Holly all shared honors for the highest May temperature in the state: 92°F on the 27th.
- 29-31 Return to cool, wet weather as low pressure area over the Southwest brought moisture into Colorado from the east. Thunderstorms on the 28th and 29th gave way to steady rains on the 30th and 31st, with fresh snow on some mountain areas. Half to one inch rainfall totals were common over eastern Colorado with lesser amounts west of the mountains.

Precipitation Summary

Precipitation totals and percents of average for May are shown in Figures 1 and 2. May, a typically wet month east of the mountains, was wetter than average over much of Colorado. The wettest areas compared to average included west central Colorado from Utah to the Continental Divide, the Upper Arkansas Valley and the Front Range and eastern foothills. Many stations in the Colorado River valley received two to three times the average May precipitation. For example, the Shoshone power plant in Glenwood Canyon totalled 5.66" for the month, 318 percent of average. The wet areas east of the Continental Divide generally

received from 150 to 250 percent of the normal precipitation. For example, Greeley's 5.06" total was 191% of average. The wettest reporting station in Colorado was Berthoud Pass with 6.88" of precipitation (204% of average) including 70 inches of new snow. Many high elevation areas across Colorado actually experienced an increase in snowpack during May. Usually by this time of year significant melting has occurred.

Despite the wet weather pattern, several areas of the state were drier than average for the month. The northeastern counties of Colorado including the cities of Julesburg, Wray, Akron, and Sterling only got about 75% of their average May precipitation. Other dry areas were noted on the southeastern plains, in the immediate Gunnison area, and on the southern slopes of the San Juan Mountains. Ignacio, near Durango, received only 0.12" of precipitation, 14% of average.

Water-Year Precipitation to Date

Accumulated precipitation for October 1982 through May 1983 is above average over practically all of Colorado (Figure 3). Along with the fact that reservoir storage is already well above average and tremendous amounts of high elevation snowpack still remain, this means that excellent water supplies will exist in the months ahead. However, high water will be a problem in some watersheds until mid-summer when most of the snow will be melted.

Temperature Summary

All of Colorado was considerably colder than average for the month of May (Figure 4). Temperatures east of the mountains were mostly 4 to 5 degrees F colder than average. Temperatures west of the Continental Divide were not quite so cold ranging generally between 1 and 4 degrees below average. Denver was the coldest reporting station in Colorado compared to average. Their monthly temperature of 51.4°F was nearly 6 degrees colder than average, the coldest May since 1946. Statewide this was the 6th consecutive May with below average temperatures.

Degree Days

During the summer months the heating degree day table (Table 1) will be presented but with no special maps or narrative discussion. Beginning next month, a table of monthly cooling degree day data will also be presented.

Figure 1. May 1983 precipitation amounts (inches).

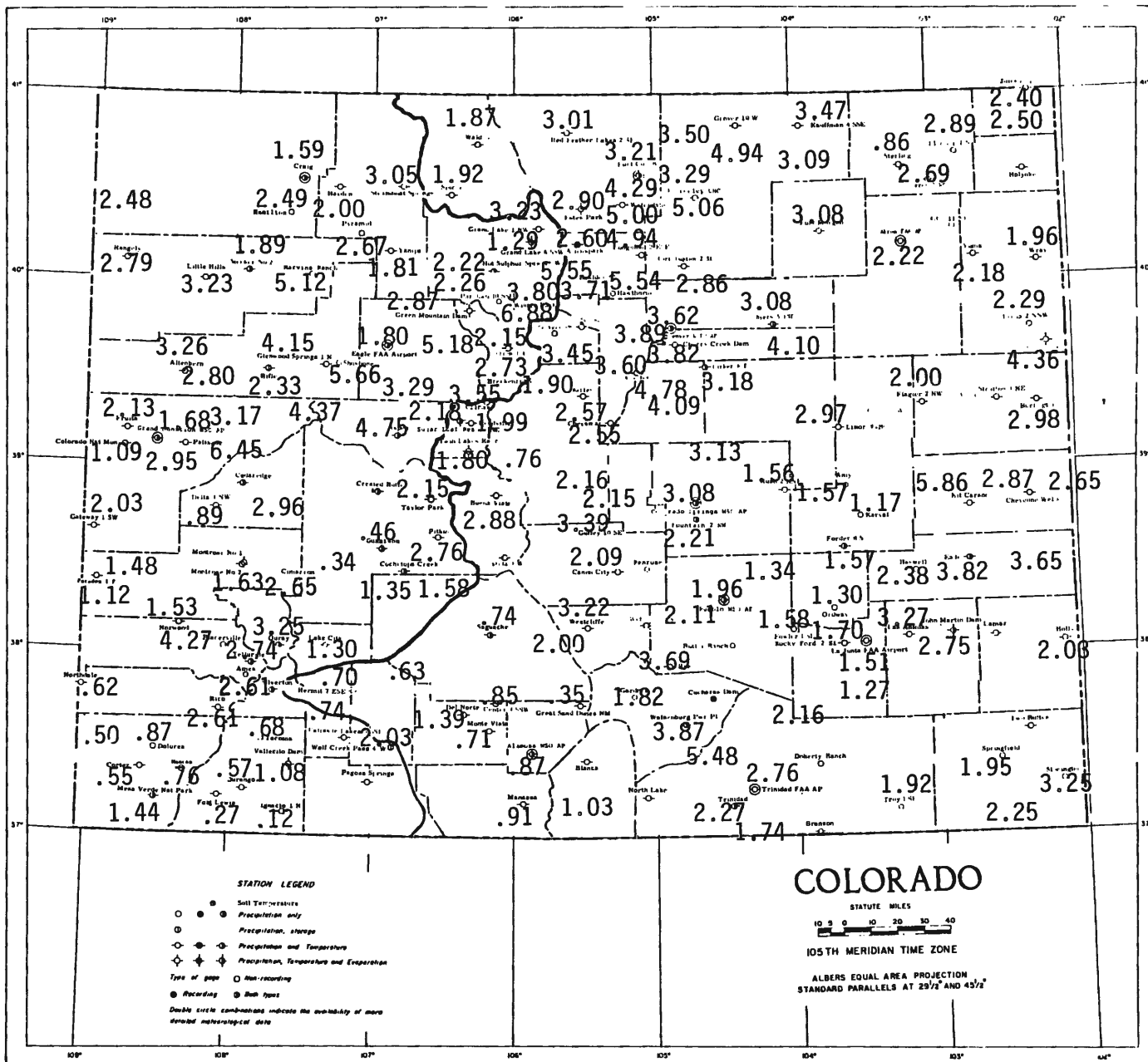


Figure 2. Precipitation for May 1983 as a percent of the 1961-1980 average.

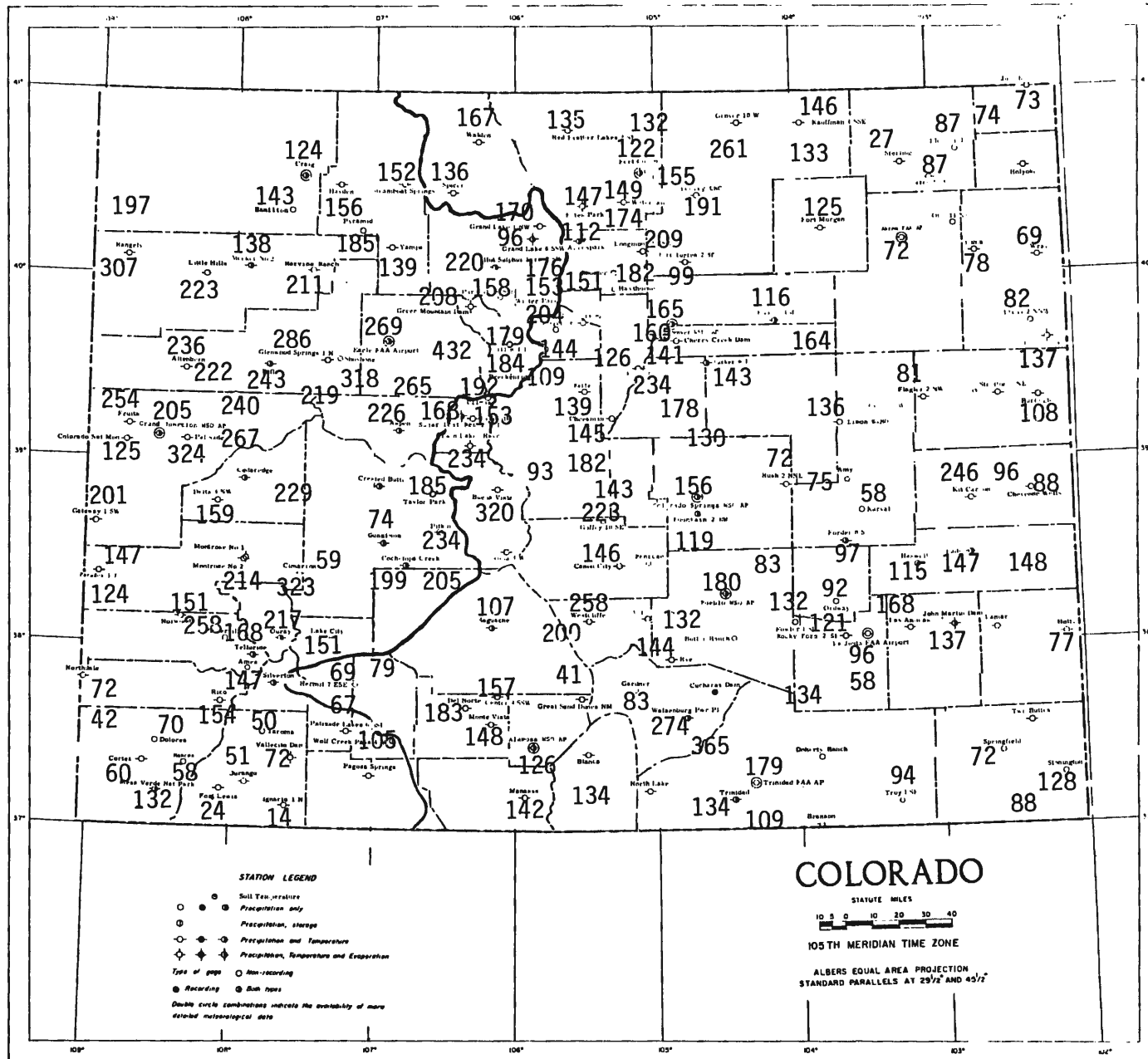


Table 1. Heating Degree Day Data for Colorado through May 1983.

		JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	ANNUAL			JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	ANNUAL	
Alamosa	average	55	96	294	648	1053	1420	1482	1182	1054	714	440	171	8609	Greeley	average	0	5	153	465	870	1147	1256	991	911	528	253	60	6639	
	1981-82	14	108	254	656	904	1366	1457	1192	977	736	508	230	8402		1981-82	5	9	31	459	651	1014	1170	942	721	511	275	82	5870	
	1982-83	59	47	274	714	1016	1361	1380	1080	945	856	556				1982-83	5	0	154	478	888	1075	988	770	806	688	379			
Aspen	average	113	161	345	654	1026	1324	1392	1176	1144	792	530	291	8948	Gunnison	average	103	169	384	704	1110	1538	1686	1397	1246	789	533	282	9941	
	1981-82	98	147	298	721	916	1279	1408	1190	1079	897	609	366	9008		1981-82	63	165	328	709	977	1354	1693	1517	1093	786	564	379	9628	
	1982-83	148	119	362	808	1105	1326	1301	1095	1066	959	691				1982-83	132	89	374	778	1146	1394	1379	1118	990	925	612			
Boulder	average	6	0	139	367	690	905	992	826	809	482	236	88	5540	Lamar	average	0	0	57	320	741	1032	1107	854	766	377	129	19	5402	
	1981-82	4	14	36	444	562	866	964	818	649	440	279	107	5183		1981-82	0	0	27	287	575	963	1076	988	615	364	117	22	5034	
	1982-83	4	0	154	442	769	913			811	639	380				1982-83	0	0	41	317	744	999	1036	770	743	523				
Burlington	average	0	0	102	363	741	1011	1085	882	828	462	210	54	5738	Limon	average	8	6	144	448	834	1070	1156	960	936	570	299	100	6531	
	1981-82	10	7	25	377	601	940	1155	990	727	499	213	78	5622		1981-82	6	26	83	516	704	1071	1244	1066	850	660	363	176	6765	
	1982-83	0	5	99	405	818	999	1006	784	832	637	339				1982-83	18	5	184	539	936	1124	1077	898	935	792	464			
Canon City	average	0	0	57	285	600	806	877	728	713	402	158	34	4660	Longmont	average	0	7	155	457	828	1076	1184	952	902	537	269	92	6459	
	1981-82	2	9	35	495	761	1095	1001	827	571	374	163	---	---		1981-82	5	12	38	481	652	979	1156	952	730	485	280	98	5868	
	1982-83	3	6	109	391	745	890	829	711	726	579	302				1982-83	7	0	164	517	894	1087	1001	809	836	664	406			
Colorado Springs	average	9	13	155	456	825	1054	1128	944	921	564	301	103	6473	Meeker	average	28	56	261	564	927	1240	1345	1086	998	651	394	164	7714	
	1981-82	5	30	70	433	640	993	1095	1001	827	571	374	163	6202		1981-82	8	72	160	572	847	1098	1254	1080	884	731	442	207	7355	
	1982-83	8	11	198	532	880	1084	1001	851	904	742	444				1982-83	33	7	245	657	998	1225	1157	1010	901	906	498			
Cortez	average	0	10	110	425	807	1104	1156	904	834	534	274	81	6239	Montrose	average	0	9	129	435	828	1132	1197	935	834	510	245	71	6325	
	1981-82	2	7	83	499	726	1076	1230	1037	825	609	362	109	6565		1981-82	0	8	38	466	714	1074	1185	976	727	525	262	47	6022	
	1982-83	17	5	132	606	856	1148	1168	939	878	723	438				1982-83	4	2	111	556	846	1104	1094	828	759	620	347			
Craig	average	32	58	275	608	996	1342	1479	1193	1094	687	419	193	8376	Pagosa Springs	average	95	114	291	611	981	1311	1401	1140	1048	711	481	233	8417	
	1981-82	19	35	149	697	901	1260	1529	1277	987	838	506	209	8407		1981-82	19	102	244	642	856	1265	1525	1197	1006	708	495	269	8328	
	1982-83	37	5	271	752	1116	1361	1305	1130	989	847	561				1982-83	76	29	253	732	938	1338	1274	1013	943	819				
Delta	average	0	0	94	394	813	1135	1197	890	753	429	167	31	5903	Pueblo	average	0	0	55	335	726	992	1082	848	775	405	148	28	5394	
	1981-82	0	1	17	375	673	966	1123	894	625	451	163	12	5300		1981-82	0	0	22	272	554	937	1046	882	582	358	151	21	4825	
	1982-83	2	4	81	496	1043	1040	753	686	513	272					1982-83	0	0	63	427	794	1010	974	833	740	561	258			
Denver	average	0	0	120	408	768	1004	1088	902	868	525	253	80	6016	Rifle	average	7	22	167	481	861	1200	1296	997	859	537	283	85	5394	
	1981-82	0	12	19	375	570	898	1070	918	733	522	306	92	5515		1981-82	0	4	513	760	1173	1342	1056	774	603	323	105	---		
	1982-83	3	0	151	487	875	1050	1017	789	885	712	419				1982-83	8	3	150	596	871	1129	1082	833	738	669	394			
Dillon	average	291	341	519	809	1173	1442	1519	1319	1321	966	701	453	10954	Salida	average	28	69	240	536	854	1094	1132	958	905	588	369	139	6910	
	1981-82	243	302	448	835	1027	1379	1520	1323	1238	1058	746	507	10626		1981-82	22	67	168	537	854	1033	1179	1096	---	---	---	---	---	---
	1982-83	318	253	511	959	1235	1450	1418	1265	1227	1158	842				1982-83	---	---	---	---	---	---	---	---	---	---	---	---	---	
Durango	average	20	37	198	502	843	1147	1212	958	880	597	375	161	6930	Steamboat Springs	average	116	159	384	691	1086	1451	1553	1277	1190	789	521	306	9523	
	1981-82	9	22	125	531	764	1047	1311	1004	845	599	383	145	6785		1981-82	83	141	257	734	973	1340	1502	1361	1069	878	589	380	9307	
	1982-83	24	6	175	614	874	1197	1130	909	850	735	405				1982-83	146	80	368	791	1183	1482	1446	1146	1024	939	618			
Eagle	average	43	79	285	626	1023	1386	1457	1168	1051	693	425	190	8426	Sterling	average	0	6	158	459	849	1150	1249	986	927	522	256	76	6638	
	1981-82	6	54	155	632	889	1244	1451	1206	904	753	479	234	8007		1981-82	8	20	79	448	755	1085	1321	1042	832	595	337	122	6644	
	1982-83	54	21	257	720	1059	1350	1273	974	880	846	529				1982-83	3	3	154	518	933	1098	1046	762	827	674	363			
Fort Collins	average	7	12	175	477	834	1076	1184	960	918	558	297	101	6599	Telluride	average	185	229	399	676	1017	1290	1333	1140	1147	825	583	345	9169	
	1981-82	8	8	42	487	661	987	1142	926	741	527	295	115	5939		1981-82	117	177	320	707	891	1209	1323	1131	1062	815	582	325	8659	
	1982-83	4	0	178	509	925	1082	968	787	830	715	389				1982-83	139	140	364	746	1022	1265	1195	1042	1036	956	620			
Fort Morgan	average	0	0	132	439	849	1141	1262	986	899	509	233	61	6511	Trinidad	average	0	0	81	364	732	980	1054	868	822	471	212	58	5642	
	1981-82	3	11	37	421	650	1035	1199	981	742	516	234	81	5910		1981-82	0	15	39	316	524	849	935	897	624	428	211	49	4887	
	1982-83	3	3	123	492	895	1086	1050	804	798	663	346				1982-83	0	0	66	367	705	949	956	779	730	619	318			
Grand Junction	average	0	0	60	324	756	1101	1190	879	738	404	133	20	5606	Walden	average	197	270	489	803	1149	1438	1538	1313	1280	89				

COLORADO CLIMATE -- JUNE 1983

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

The trend toward cooler and wetter than average weather conditions, which began in mid-March, continued through the month of June across most of Colorado. The unusual combination of prolonged cool temperatures throughout the spring and a deep and widespread late-spring snowpack contributed to very high runoff in most major watersheds of the state. Flood waters covered square miles of farmland, displaced people from their homes, and produced damaging erosion along the Colorado, the Arkansas, and the Platte Rivers and some of their tributaries.

Significant Highlights -- June

<u>Date</u>	<u>Event</u>
1-10	Cool, unsettled period. Frequent showers and thunderstorms, particularly east of the mountains. Some high elevation snow. Cold front moving southward across eastern Colorado on the 4th triggered severe thunderstorms. Greeley was pelted with large hail up to baseball size which caused millions of dollars of property damage. Cool rains developed in upslope flow behind the front on the 5th. More than an inch of rain fell on the 5th in parts of southeastern Colorado. Unseasonably chilly temperatures were observed on the 6th including 33°F at Boulder, 34°F at Limon, and 38°F at Burlington, Denver, and Fort Collins. Precipitation continued in the mountains on the 6th. Climax and Berthoud Pass each received about 5" of new snow. Gradual clearing and warming took place for the rest of the period with showers becoming lighter and less numerous over the state.
11	Briefly quite warm in advance of a major winter-like storm system approaching from the west. Grand Junction hit 90°.
12-14	Storm system crossed the state. Widespread precipitation over all except the southern edge of Colorado. Both Rifle and Craig received 1.00" of rain on the 12th, unusually heavy for those areas. Very cold temperatures followed on the 13th with the snow line dropping to about 8,000 feet. Daytime temperatures stayed in the 50's even at many lower elevation locations. Berthoud Pass received another 6" of

- snow bringing their winter total to 485.6". Telluride received 5". As skies cleared, very chilly temperatures were noted on the 14th in the mountains and western valleys. Temperatures dropped to 35°F at Montrose, 27° at Pagosa Springs, and 25° at Dillon. Taylor Park Dam was again the coldest station in Colorado with a 15° reading.
- 15-17 Generally dry with gradual return to seasonal temperatures.
- 18-23 Summer heatwave developed over the state. Rapid mountain snowmelt produced flooding conditions on many rivers and streams. Daytime temperatures ranged from the low 60's in the high mountains to above 100° in the Arkansas Valley. Grand Junction, Greeley, Fort Morgan and Fort Collins all hit 95° on the 18th. The hottest temperatures of the month occurred on the 21st. Las Animas and Holly each hit 105°F on the 21st. The hottest in the state. Dry period except for a few widely scattered evening thundershowers across the northeastern plains.
- 24-28 Abundant moisture moved into Colorado from the southwest. Widespread thundershower activity broke out, especially from the Front Range westward to Utah. Daily rainfall totals of 0.20 to 0.50" were common in western Colorado with locally heavier amounts contributing to flooding conditions. Severe local storm dropped 1.87" of rain on Fort Collins in about one hour on the 25th. More widespread heavy rains on the 26th developed just east of the mountains. Denver received 1.37" on the 26th. Cherry Creek Dam totalled 2.59" by the 27th. Cold daytime temperatures on the 27th east of the mountains. Fort Morgan, for example only reached 57°F.
- 29-30 A return to summer-like weather.

Precipitation Summary

Precipitation totals and percents of average for June are shown in Figures 1 and 2. June is normally the driest month of the year for many areas west of the Continental Divide. This year was an exception. Almost all of western Colorado was wetter than average. West central Colorado was especially wet. Rifle, for example, totalled 3.23" of rain, nearly 4 times the average and the most June precipitation on record. A new record was also set at Palisade where 3.00 inches of rain fell.

Significantly above average precipitation was also observed over portions of the Front Range, the northeast plains, the eastern foothills south from Colorado Springs to New Mexico, and in the San Luis Valley.

Monte Vista received 2.01", 437% of average. Sedgwick, in extreme northeast Colorado, was the wettest location in the state with a monthly total of 5.82".

As usual, there were some exceptions. Slightly below average precipitation fell in the Kremmling area, near Limon and across extreme eastern Colorado. Considerably drier than average conditions were observed in southeastern Colorado. Ordway received just 0.59" for the month, 44% of average. Several locations including Las Animas, Springfield, and Stonington received less than 50% of average.

Water-Year Precipitation to Date

Accumulated precipitation for the first 9 months of the 1983 water year continues to be above average over practically the entire state. Only a few localized dry spots remain including the extreme southeastern plains and parts of the Gunnison Valley. The wettest areas include much of the Front Range and eastern foothills, portions of the northeast plains, and the immediate Colorado River Valley. Berthoud Pass is currently 10 inches above average for the water year. Denver, Walsenburg and Fort Morgan are each 7" above average.

Temperature Summary

The entire state was cooler than average for the third month in a row (Figure 4). Western Colorado was mostly one to three degrees below average. Much of eastern Colorado was 4 degrees Fahrenheit colder than average.

Degree Days

Tables of heating degree days (Table 1) and cooling degree days (Table 2) are presented in this report, both derived using a 65°F base. No special maps or narrative are included during the summer months.

Figure 1. June 1983 precipitation amounts (inches).

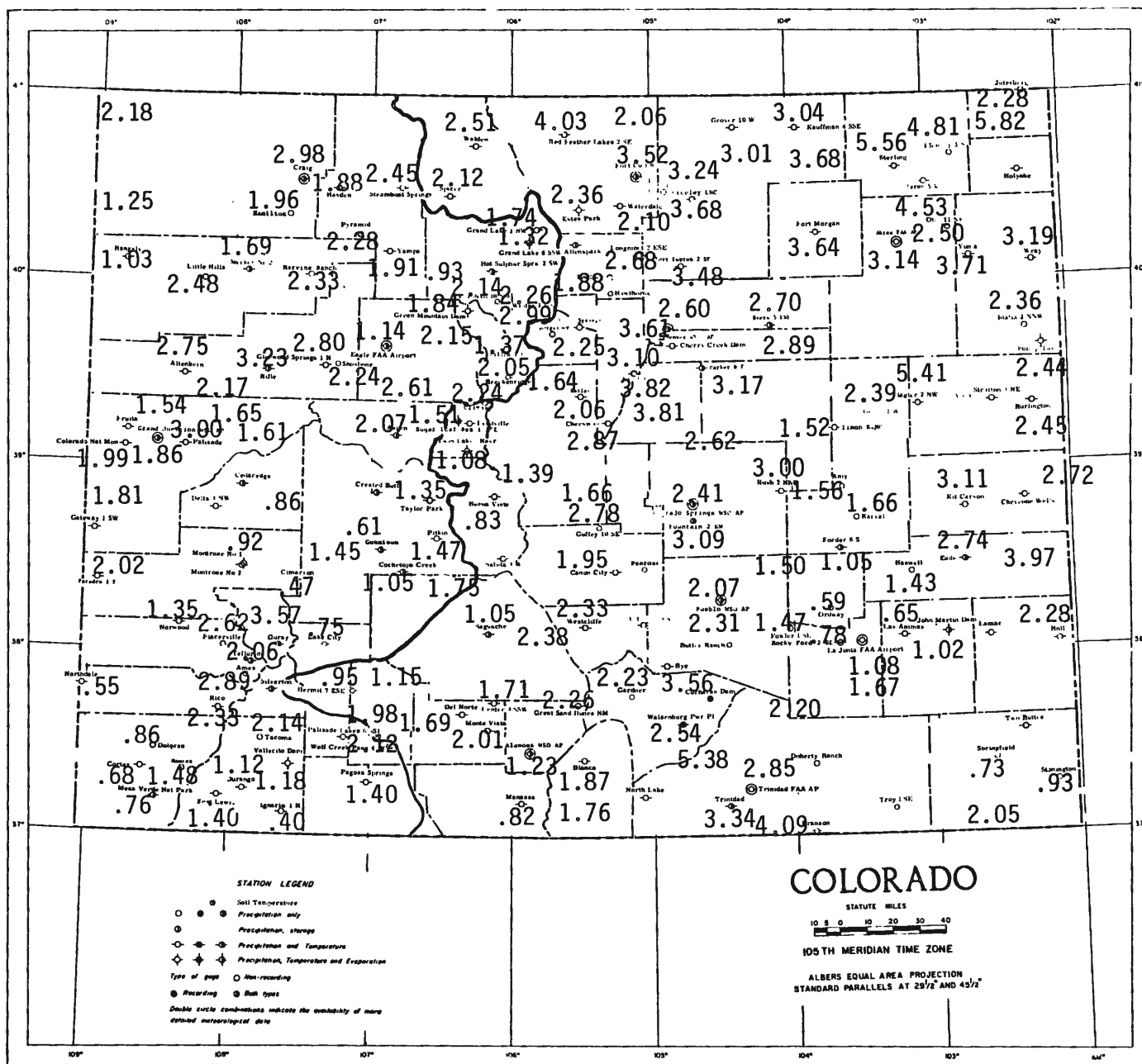


Figure 2. Precipitation for June 1983 as a percent of the 1961-1980 average.

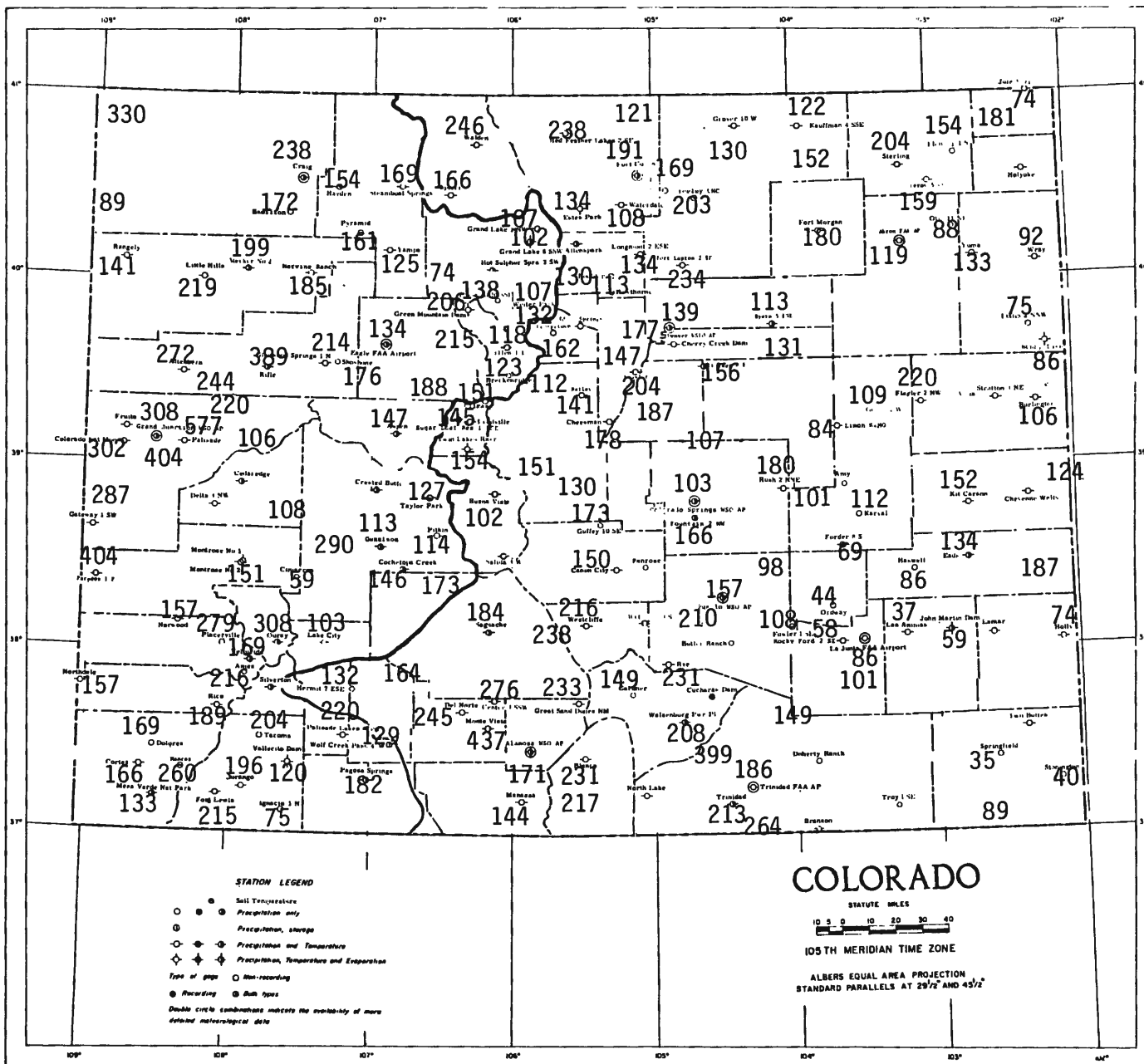


Figure 3. Precipitation for October 1982 through June 1983 as a percent of the 1961-1980 average.

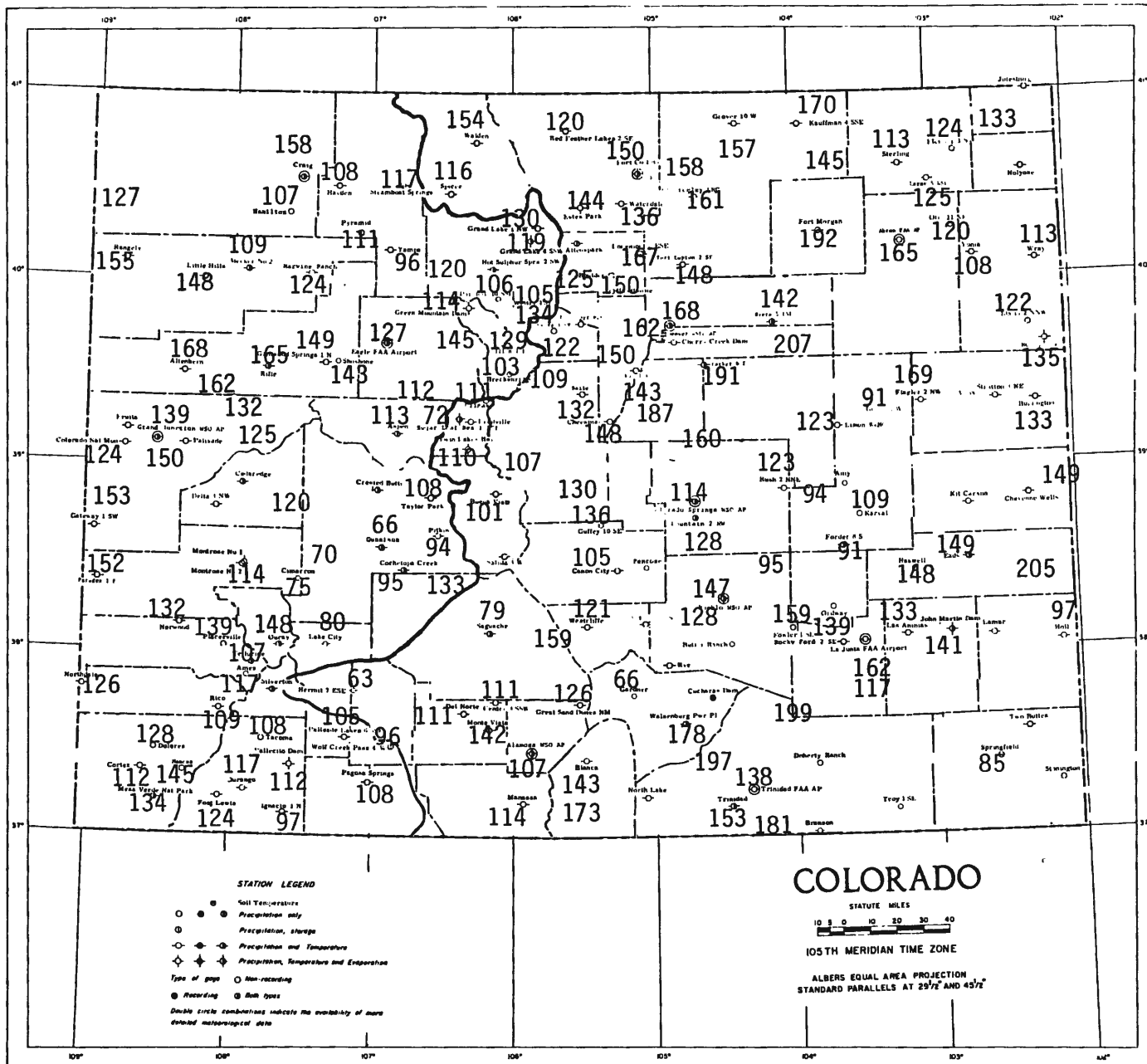


Table 1. Heating Degree Day Data for Colorado through June 1983.

		JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	ANNUAL															
		JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	ANNUAL	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	ANNUAL		
Alamosa	average	55	96	294	648	1053	1420	1482	1182	1054	714	440	171	8609	Greeley	average	0	5	153	465	870	1147	1256	991	911	528	253	60	6639
	1981-82	14	108	254	656	904	1366	1457	1192	977	736	508	230	8402		1981-82	5	9	31	459	651	1014	1170	942	721	511	275	82	5870
	1982-83	59	47	274	714	1016	1361	1380	1080	945	856	556	249	8537		1982-83	5	0	154	478	888	1075	988	770	806	688	379	113	6344
Aspen	average	113	161	345	654	1026	1324	1392	1176	1144	792	530	291	8948	Gunnison	average	103	169	384	704	1110	1538	1686	1397	1246	789	533	282	9941
	1981-82	98	147	298	721	916	1279	1408	1190	1079	897	609	366	9008		1981-82	63	165	328	709	977	1354	1693	1517	1093	786	564	379	9628
	1982-83	148	119	362	808	1105	1326	1301	1095	1066	959	691	350	9330		1982-83	132	89	374	778	1146	1394	1379	1118	990	925	612	318	9255
Boulder	average	6	0	139	367	690	905	992	826	809	482	236	88	5540	Lamar	average	0	0	57	320	741	1032	1107	854	766	377	129	19	5402
	1981-82	4	14	36	444	562	866	964	818	649	440	279	107	5183		1981-82	0	0	27	287	575	963	1076	988	615	364	117	22	5034
	1982-83	4	0	154	442	769	913	896	819	639	380	120		6014		1982-83	0	0	41	317	744	999	1036	770	743	523	229		
Burlington	average	0	0	102	363	741	1011	1085	882	828	462	210	54	5738	Limon	average	8	6	144	448	834	1070	1156	960	936	570	299	100	6531
	1981-82	10	7	25	377	601	940	1155	990	727	499	213	78	5622		1981-82	6	26	83	516	704	1071	1244	1066	850	660	363	176	6765
	1982-83	0	5	99	405	818	999	1006	784	832	637	339	81	6005		1982-83	18	5	184	539	936	1124	1077	898	935	792	464	166	7138
Canon City	average	0	0	57	285	600	806	877	728	713	402	158	34	4660	Longmont	average	0	7	155	457	828	1076	1184	952	902	537	269	92	6459
	1981-82	2	9	35	377	495	761	892	827	571	374	163	84	---		1981-82	5	12	38	481	652	979	1156	952	730	485	280	98	5868
	1982-83	3	6	109	391	745	890	829	711	726	579	302	85	5376		1982-83	7	0	164	517	894	1087	1001	809	836	664	406	128	6513
Colorado Springs	average	9	13	155	456	825	1054	1128	944	921	564	301	103	6473	Meeker	average	28	56	261	564	927	1240	1345	1086	998	651	394	164	7714
	1981-82	5	30	70	433	640	993	1095	1001	827	571	374	163	6202		1981-82	8	72	160	572	847	1098	1254	1080	884	731	442	207	7355
	1982-83	8	11	198	532	880	1084	1001	851	904	742	444	159	6814		1982-83	33	7	245	657	998	1225	1157	1010	901	806	498	199	7736
Cortez	average	0	10	110	425	807	1104	1156	904	834	534	274	81	6239	Montrose	average	0	9	129	435	828	1132	1197	935	834	510	245	71	6325
	1981-82	2	7	83	499	726	1076	1230	1037	825	609	362	109	6565		1981-82	0	8	38	466	714	1074	1185	976	727	525	262	47	6022
	1982-83	17	5	132	606	856	1148	1168	939	878	723	438	131	7041		1982-83	4	2	111	556	846	1104	1094	828	759	620	347	89	6360
Craig	average	32	58	275	608	996	1342	1479	1193	1094	687	419	193	8376	Pagosa Springs	average	95	114	291	611	981	1311	1401	1140	1048	711	481	233	8417
	1981-82	19	35	149	697	901	1260	1529	1277	987	838	506	209	8407		1981-82	19	102	244	642	856	1265	1525	1197	1006	708	495	269	8328
	1982-83	37	5	271	752	1116	1361	1305	1130	989	847	561	228	8602		1982-83	76	29	253	732	938	1338	1274	1013	943	819	565	286	8266
Delta	average	0	0	94	394	813	1135	1197	890	753	429	167	31	5903	Pueblo	average	0	0	55	335	726	992	1082	848	775	405	148	28	5394
	1981-82	0	1	17	375	673	966	1123	894	625	451	163	12	5300		1981-82	0	0	22	272	554	937	1046	882	582	358	151	21	4825
	1982-83	2	4	81	496	777	1043	1040	753	686	513	272	66	5733		1982-83	0	0	63	427	794	1010	974	833	740	561	258	50	5639
Denver	average	0	0	120	408	768	1004	1088	902	868	525	253	80	6016	Rifle	average	7	22	167	481	861	1200	1296	997	859	537	283	85	5394
	1981-82	0	12	19	375	570	898	1070	918	733	522	306	92	5515		1981-82	0	42	513	1342	1056	774	603	323	105				
	1982-83	3	0	151	487	875	1050	1017	789	885	712	419	129	6517		1982-83	8	3	150	596	871	1129	1082	833	738	669	394	107	6580
Dillon	average	291	341	519	809	1173	1442	1519	1319	1321	966	701	453	10854	Salida	average	28	69	240	536	854	1094	1132	958	905	588	369	139	6910
	1981-82	243	302	448	835	1027	1379	1520	1323	1238	1058	746	507	10626		1981-82	22	67	168	537	---	1033	1179	1096	---	---	---	---	---
	1982-83	318	253	511	959	1235	1450	1418	1265	1227	1158	842	496	11132		1982-83	--	--	--	---	---	---	---	---	---	---	---	---	---
Durango	average	20	37	198	502	843	1147	1212	958	880	597	375	161	6930	Steamboat Springs	average	116	159	384	691	1086	1451	1553	1277	1190	789	521	306	9523
	1981-82	9	22	125	531	764	1047	1311	1004	845	599	383	145	6785		1981-82	83	141	257	734	973	1340	1502	1361	1069	878	589	380	9307
	1982-83	24	6	175	614	874	1197	1130	909	850	735	405	147	7066		1982-83	146	80	368	791	1183	1482	1446	1146	1024	939	618	333	9556
Eagle	average	43	79	285	626	1023	1386	1457	1168	1051	693	425	190	8426	Sterling	average	0	6	158	459	849	1150	1249	986	927	522	256	76	6638
	1981-82	6	54	155	632	889	1244	1451	1206	904	753	479	234	8007		1981-82	8	20	79	448	755	1085	1321	1042	832	595	337	122	6644
	1982-83	54	21	257	720	1059	1350	1273	974	880	846	529	219	8182		1982-83	3	3	154	518	933	1098	1046	762	827	674	363	111	6492
Fort Collins	average	7	12	175	477	834	1076	1184	960	918	558	297	101	6599	Telluride	average	185	229	399	676	1017	1290	1333	1140	1147	825	583	345	9169
	1981-82	8	8	42	487	661	987	1142	926	741	527	295	115	5939		1981-82	117	177	320	707	891	1209	1323	1131	1062	815	582	325	8659
	1982-83	4	0	178	509	925	1082	968	787	830	715	389	127	6514		1982-83	139	140	364	746	1022	1265	1195	1042	1036	956	620	355	8880
Fort Morgan	average	0	0	132	439	849	1141	1262	986	899	509	233	61	6511	Trinidad	average	0	0	81	364	732	980	1054	868	822	471	212	58	5642
	1981-82	3	11	37	421	650	1035	1199	981	742	516	234	81	5910		1981-82	0	15	39	316	524	849	935	897	624	428	211	49	4887
	1982-83	3	3	123	492	895	1086	1050	804	798	663	346	108	6371		1982-83													

COLORADO CLIMATE -- JULY 1983

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Flood waters receded during July, the majority of the high elevation snows finally melted, and fairly normal mid-summer weather finally became established. However, unusually wet conditions continued in parts of the mountains as heavy thunderstorms rumbled across the western half of Colorado.

Significant Highlights -- July

<u>Date</u>	<u>Event</u>
1-2	Warm and dry -- chilly nights in the mountains.
3	Windy and cooler as a sharp cold front crossed the state. A few showers accompanied the front in northern portions of Colorado.
4-5	Cool, clear, and dry -- a lovely Fourth of July. Most of the state experienced their coolest temperatures for the month, subfreezing at higher elevations. Berthoud Pass dipped to 26° on the 4th, the coldest in the state. Walden, Leadville, and Grand Lake all hit 28°F.
5-9	Large high pressure ridge dominated the center of the country. Hot temperatures, especially east of the mountains -- 90's and 100's with 70's and 80's in the mountains. Fairly dry except for scattered afternoon and evening thundershowers mostly over the western half of the state. The Grand Lake 6SSW station reported 0.70" of rain on the 7th from a local storm.
10-11	Scattered but locally intense thunderstorms were triggered by a cold front crossing Colorado. Buena Vista and the Trinidad airport both received more than an inch of rain. Boulder received 2.06" of rain and a 34 degree drop in temperature in about 2 hours during the afternoon of the 10th. Very hot on the 10th (Las Animas hit 106°F, the hottest in Colorado for the month) followed by much cooler readings on the 11th. Sterling, for example, had a high of only 74° following a 97° reading on the 10th.

- 12-16 A little cooler than normal 12th and 13th with a few showers mostly in the southern part of the state. Warmer on the 14th and 15th with light shower activity limited to areas near the mountains. Cooler on the 16th as a Pacific cold front crossed the state.
- 17-31 Stagnant high pressure ridge dominated the eastern two-thirds of the U.S. -- severe heat wave and dry spell. Hot and unusually humid over most of Colorado as moisture streamed up into the state from the southwest. Thunderstorms, some very heavy, fell each day, especially over the mountains, foothills, and southwestern corner of the state. Ridgway, near Ouray, totalled nearly 4" of rain from the 18th to the 27th. Examples of heavy one-day rainfall amounts included 1.75" at Cimarron on the 18th, 1.85" at Winter Park on the 19th, 2.10" at Evergreen on the 21st, 1.66" at Cherry Creek Dam on the 22nd, 1.12" at Fort Lewis and 1.58" at Flagler on the 23rd, 2" of rain at the Craig airport on the 25th, 1.05" at Lakewood on the 26th, and 2.00" at Pyramid (near Yampa) on the 27th. These storms produced hail, severe lightning, and local flooding conditions. Hot days and mild nights contributed to ideal growing conditions for much of Colorado's warm weather agricultural crops. As July ended, showers became less numerous but continued to build up daily.

Precipitation Summary

Precipitation totals and percents of average for July are shown in Figures 1 and 2. Precipitation was extremely variable ranging from little to none in parts of southeastern Colorado to two to three times average in portions of western Colorado. La Junta, for example, recorded no precipitation in July. Meanwhile, Castle Rock totalled 4.82" for the month, two times their average. Placerville was the wettest reporting station with a monthly total of 5.82", 240% of average. Grand Junction's 1.92" July total was 343% of average, the greatest departure from average in the state. The Winter Park and Pyramid weather stations, each receiving nearly four and three quarters inches of rain, set new records for their wettest July.

The wettest areas of the state in July were the southwest and northwest slopes of the San Juan Mountains, the northern mountains from Steamboat Springs to Berthoud Pass, North Park, the northwestern and west central valleys and a small area along the Front Range from Longmont southward to Castle Rock and eastward to Deer Trail. Dry areas included a small strip in the mountains from Lake City northeastward to

Breckenridge, the Rio Grande drainage, all of the Arkansas Valley from Canon City southeastward and portions of northeastern Colorado.

Water-Year Precipitation to Date

Ten months of the 1983 water year are now history and most of Colorado continues with above average accumulated precipitation (Figure 3). The only below average areas are a small area near Gunnison, the western portion of the Rio Grande drainage, a small area north of Rocky Ford, and extreme southeastern Colorado. The wettest areas are west central Colorado and a smaller region just east of the mountains from Fort Collins south to Castle Rock eastward to Akron. These areas are at least 50% wetter than average for the past 10 months.

Temperature Summary

Temperatures were close to average for the month of July (Figure 4). Slightly cooler than average temperatures were noted in most of northwestern Colorado, in the upper Arkansas Valley, and in Weld and Logan Counties. Temperatures were a little warmer than average in the Gunnison Valley, in southwestern Colorado and over most of the eastern plains. The only significant departures from normal anywhere in the state were observed in southeastern Colorado where both Las Animas and Springfield were more than two degrees above average.

Degree Days

Tables of heating degree days (Table 1) and cooling degree days (Table 2) are presented in this report, both derived using a 65°F base. No special maps or narrative are included during the summer months. The following three stations have been added to these tables: Evergreen, Grand Lake, and Las Animas.

Figure 1. July 1983 precipitation amounts (inches).

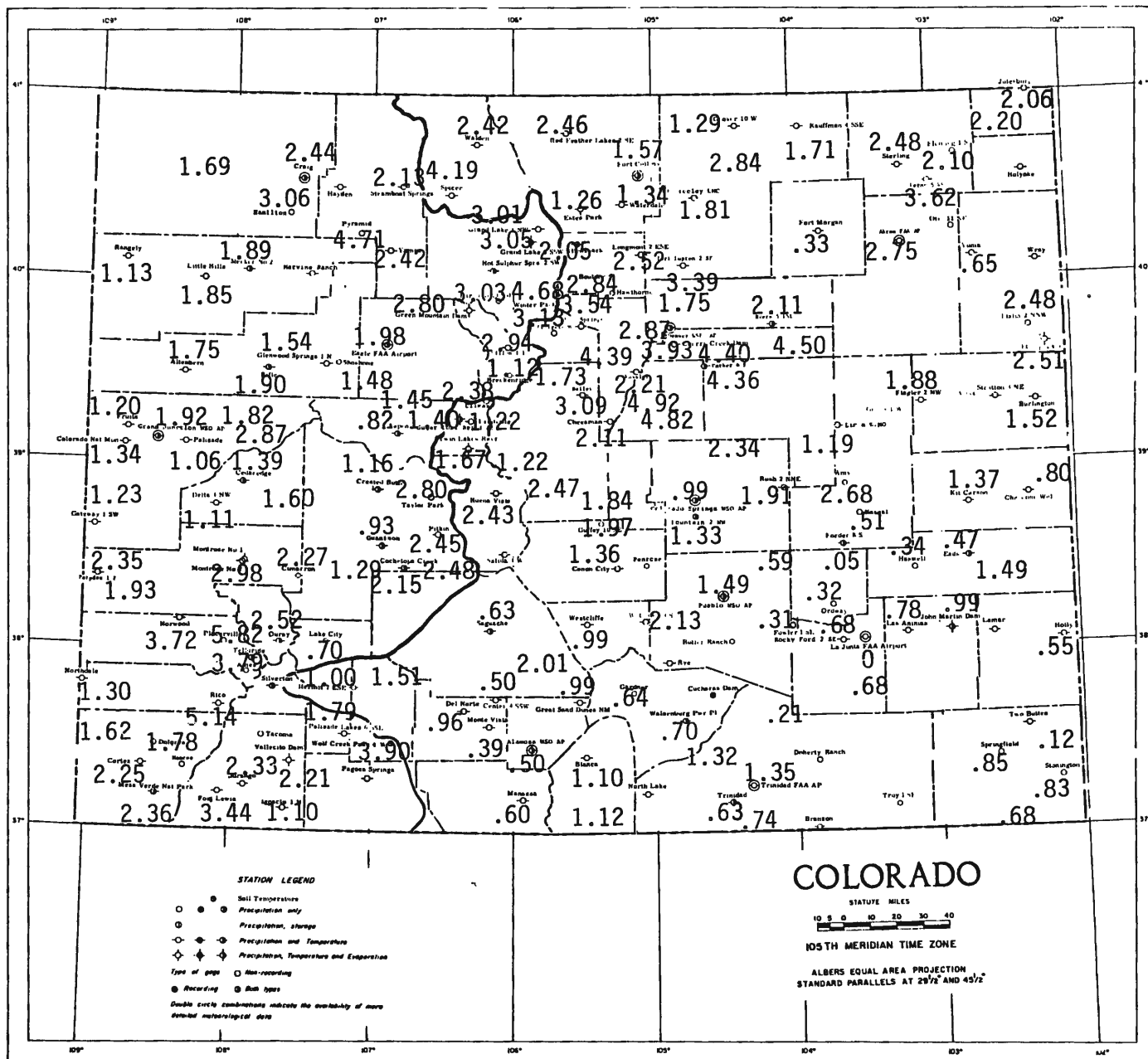


Figure 2. Precipitation for July 1983 as a percent of the 1961-1980 average.

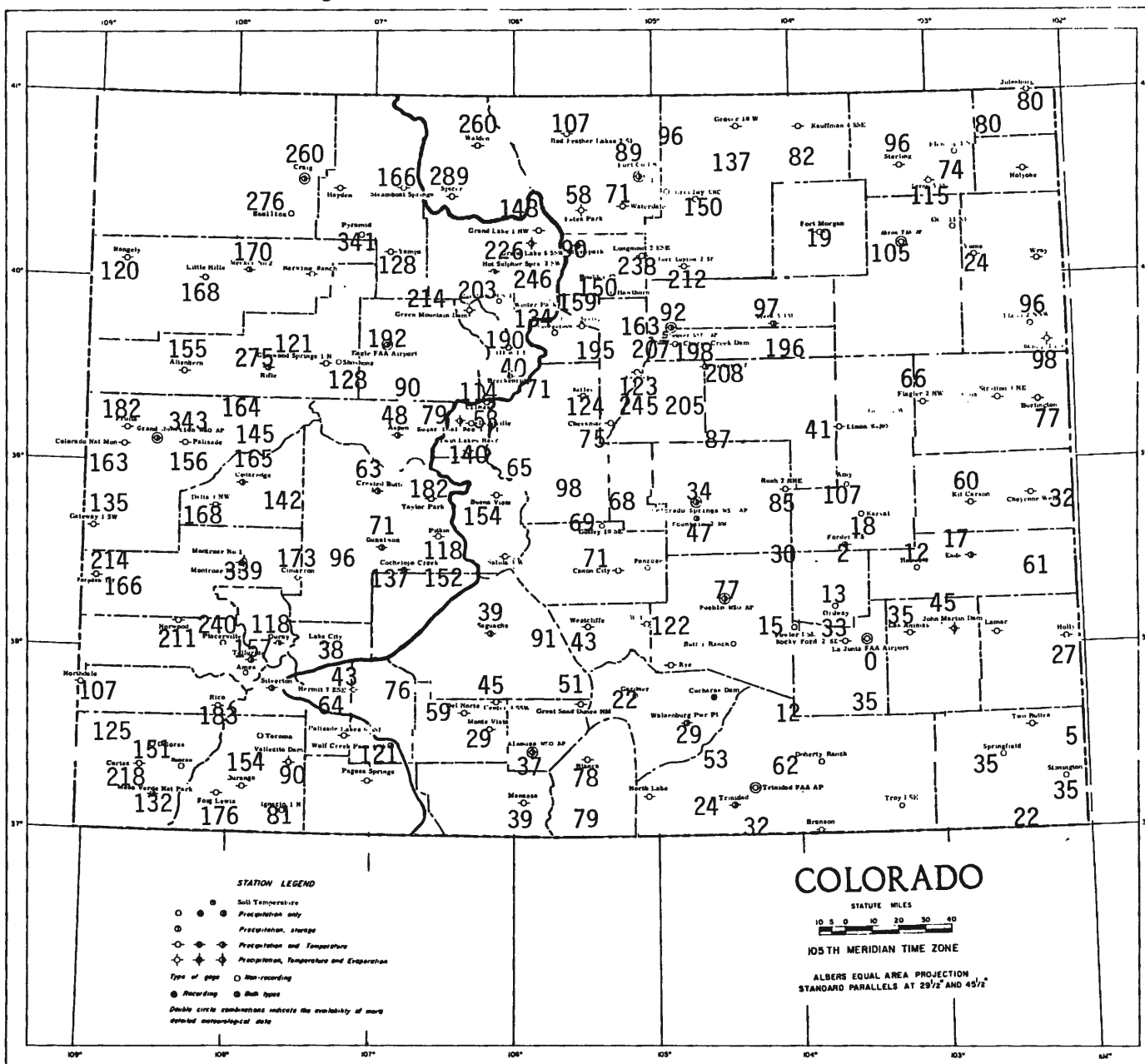


Figure 3. Precipitation for October 1982 through July 1983 as a percent of the 1961-1980 average.

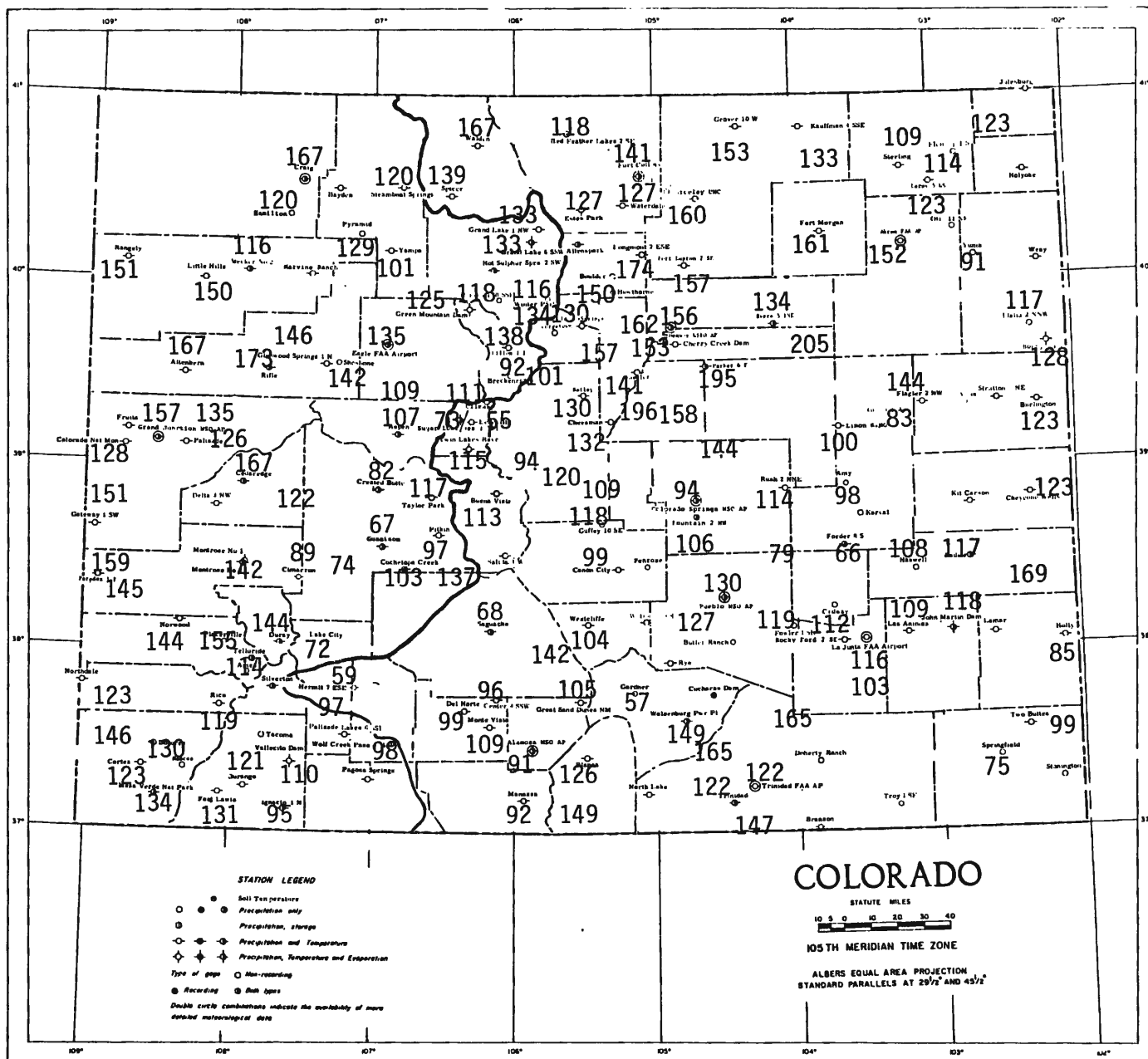


Figure 4. Temperatures for July 1983 in degrees Fahrenheit (in parentheses) and departures from the 1961-1980 average.

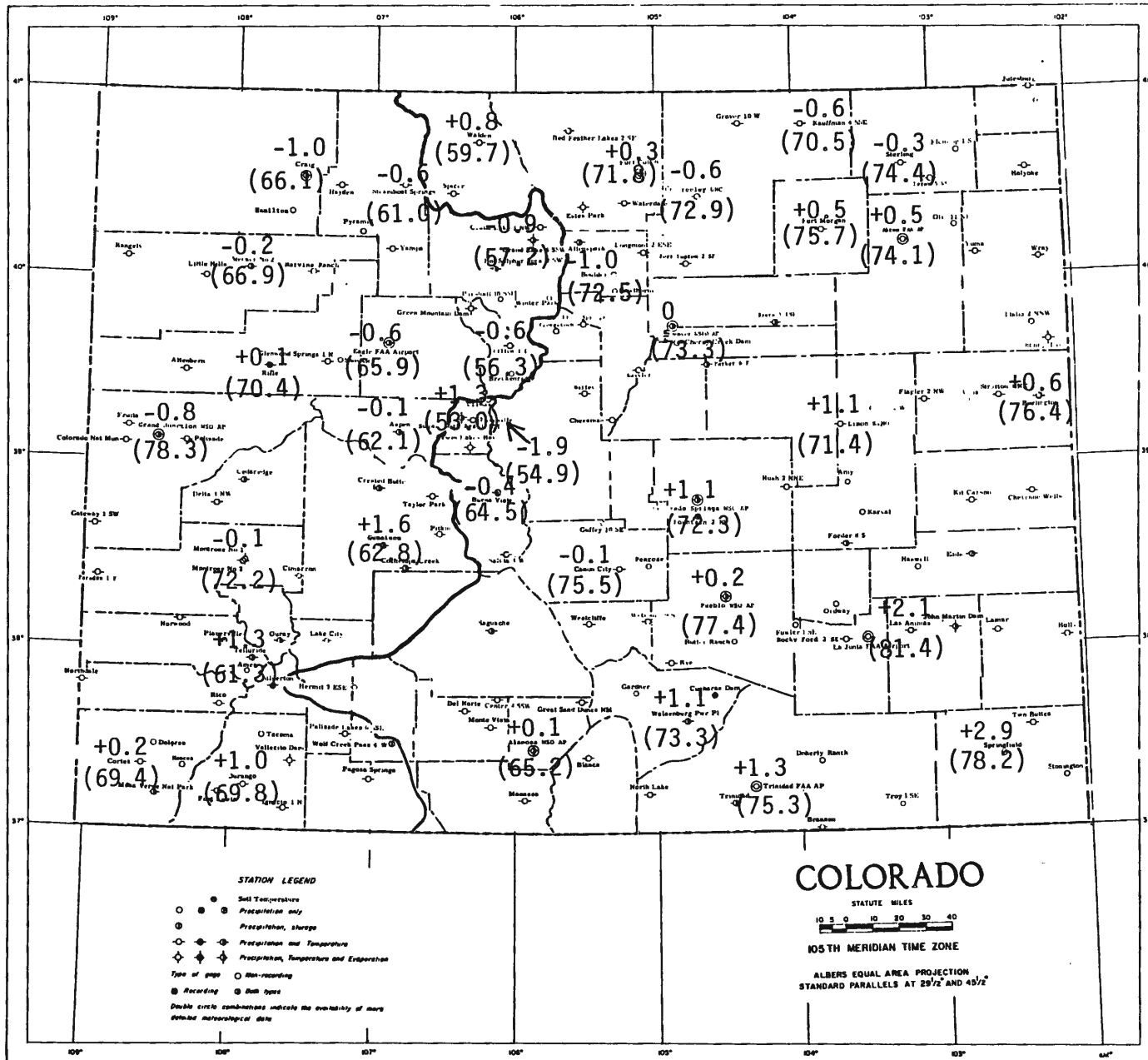


Table 1. Colorado Heating Degree Day Data through July 1983.

STATION		JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	ANN	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	GRAND LAKE	AVE	214	264	468	775	1128	1473	1593	1369	1318	951	654	334	10521
	82-83	59	47	274	714	1016	1361	1380	1080	945	856	556	249	8537		82-83	254	180	452	878	1236	1505	1489	1280	1219	1157	803	443	10855
	83-84	28												29		83-84	233												
ASPEN	AVE	95	150	348	651	1029	1339	1376	1162	1116	798	524	252	8850	GREELEY	AVE	0	0	149	450	861	1128	1240	946	856	522	238	52	6442
	82-83	148	119	362	808	1105	1326	1301	1095	1066	959	691	350	9330		82-83	5	0	154	478	888	1075	988	770	806	688	379	113	6344
	83-84	97												97		83-84	3												
BOULDER	AVE	0	6	130	357	714	908	1004	804	775	483	220	59	5460	GUNNISON	AVE	111	188	393	719	1119	1590	1714	1422	1231	816	543	276	10122
	82-83	4	0	154	442	769	913	963	819	811	639	380	120	6014		82-83	132	89	374	778	1146	1394	1379	1118	990	925	612	318	9255
	83-84	4												4		83-84	75												
BUENA VISTA	AVE	47	116	285	577	936	1184	1218	1025	983	720	459	184	7734	LAS ANIMAS	AVE	0	0	45	296	729	998	1101	820	698	348	102	9	5146
	82-83	47	70	284	745	998	1160	1105	995	990	897	547	266	7904		82-83	0	0	43	313	758	978	1012	747	682	481	198	18	5230
	83-84	45												45		83-84	0												
BURLINGTON	AVE	6	5	108	364	762	1017	1110	871	803	459	200	38	5743	LEADVILLE	AVE	272	337	522	817	1173	1435	1473	1318	1320	1038	726	439	10870
	82-83	0	5	99	405	818	999	1006	784	832	637	339	8	6005		82-83	323	540	974	1260	1426	1399	1259	1301	1220	886	544	11132	
	83-84	0												0		83-84	308												
CANNON CITY	AVE	0	9	81	301	639	831	911	734	707	411	179	33	4836	LIMON	AVE	8	6	144	448	834	1070	1156	960	936	570	299	100	6531
	82-83	3	6	109	391	745	890	829	711	726	579	302	85	5376		82-83	18	5	184	539	936	1124	1077	898	935	792	464	166	7138
	83-84	0												0		83-84	7												
COLORADO SPRINGS	AVE	8	25	162	440	819	1042	1122	910	880	564	296	78	6346	LONGMONT	AVE	0	6	162	453	843	1082	1194	938	874	546	256	78	6432
	82-83	8	11	198	532	880	1084	1001	851	904	742	444	159	6814		82-83	7	0	164	517	894	1087	1001	809	836	664	406	128	6513
	83-84	2												2		83-84	1												
CORTEZ	AVE	0	11	115	434	813	1132	1181	921	828	555	292	68	6350	MEEKER	AVE	28	56	261	564	927	1240	1345	1086	998	651	394	164	7714
	82-83	17	5	132	606	856	1148	1168	939	878	723	438	131	7041		82-83	33	7	245	657	998	1225	1157	1010	901	806	498	199	7736
	83-84	5												5		83-84	12												
CRAIG	AVE	32	58	275	608	996	1342	1479	1193	1094	687	419	193	8376	MONTROSE	AVE	0	10	135	437	837	1159	1218	941	818	522	254	69	6400
	82-83	37	5	271	752	1116	1361	1305	1130	989	847	561	228	8602		82-83	4	2	111	556	846	1104	1094	828	759	620	347	89	6360
	83-84	41												41		83-84	0												
DELTA	AVE	0	0	94	394	813	1135	1197	890	753	429	167	31	5903	PAGOSA SPRINGS	AVE	82	113	297	608	981	1305	1380	1123	1026	732	487	233	8367
	82-83	2	4	81	496	777	1043	1040	753	686	513	272	66	5733		82-83	76	29	253	732	938	1338	1274	1013	943	819	565	286	8266
	83-84	0												0		83-84	0												
DENVER	AVE	0	0	135	414	789	1004	1101	879	837	528	253	74	6014	PUEBLO	AVE	0	0	89	346	744	998	1091	834	756	421	163	23	5465
	82-83	3	0	151	487	875	1050	1017	789	885	712	419	129	6517		82-83	0	0	63	427	794	1010	974	833	740	561	258	50	5710
	83-84	3												3		83-84	0												
DILLON	AVE	273	332	513	806	1167	1435	1516	1305	1296	972	704	435	10754	RIFLE	AVE	6	24	177	499	876	1249	1321	1002	856	555	298	82	6945
	82-83	318	253	511	959	1235	1450	1418	1265	1227	1158	842	496	11132		82-83	8	3	150	596	871	1129	1082	833	738	669	394	107	6580
	83-84	263												263		83-84	3												
DURANGO	AVE	9	34	193	493	837	1153	1218	958	862	600	366	125	6848	STEAMBOAT SPRINGS	AVE	113	169	390	704	1101	1476	1541	1277	1184	810	533	297	9595
	82-83	24	6	175	614	874	1197	1130	909	850	735	405	147	7066		82-83	146	80	368	791	1183	1482	1446	1146	1024	939	619	333	9556
	83-84	3												3		83-84	120												
EAGLE	AVE	33	80	288	626	1026	1407	1448	1148	1014	705	431	171	8377	STERLING	AVE	0	6	157	462	876	1163	1274	966	896	528	235	51	6614
	82-83	54	21	257	720	1059	1350	1273	974	880	846	529	219	8182		82-83	3	3	154	518	933	1098	1046	762	827	674	363	111	6492
	83-84	30												30		83-84	1												
EVERGREEN	AVE	59	113	327	621	916	1135	1199	1011	1009	730	499	218	7827	TELLURIDE	AVE	163	223	396	676	1026	1293	1339	1151	1141	849	589	313	9164
	82-83	110	41	339	733	1032	1184	940	979	1056	961	694	324	8393		82-83	139	140	364	746	1022	1265	1195	1042	1036	956	520	355	8943
	83-84	72												72		83-84	108												
FORT COLLINS	AVE	5	11	171	468	846	1073	1181	930	877	558	291	92	6483	TRINIDAD	AVE	0	0	86	359	738	973	1051	846	791	468	207	35	5524
	82-83	4	0	179	509	925	1082	968	787	830	715	389	127	6514		82-83	0	0	66	367	705	949	956	779	730	619	318	55	5555
	83-84	2												2		83-84	0												
FORT MORGAN	AVE	0	6	140	438	867	1156	1283	969	874	516	224	47	6520	WALDEN	AVE	198	285	501	822	1170	1457	1535	1313	1277	915	642	351	10466
	82-83	3	3	123	492	895	1086	1050	804	798	663	346	108	6371		82-83	201	141	469	878	1242	1441	1396	1173	1122	1052	761	391	10267

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

STATION		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN	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	GRAND LAKE	AVE	0	0	0	0	0	0	0	0	0	0	0	0	0	
	1982	0	0	0	0	0	0	38	27	0	0	0	0	65		1982	0	0	0	0	0	0	0	0	0	0	0	0	0	
	1983	0	0	0	0	0	4	43						47		1983	0	0	0	0	0	0	0	0	0	0	0	0	0	
ASPEN	AVE	0	0	0	0	0	7	18	11	0	0	0	0	36	GREELEY	AVE	0	0	0	0	15	130	267	185	50	0	0	0	647	
	1982	0	0	0	0	0	0	6	2	0	0	0	0	8		1982	0	0	0	4	3	41	232	259	42	0	0	0	581	
	1983	0	0	0	0	0	0	11						11		1983	0	0	0	0	5	83	257					345		
BOULDER	AVE	0	0	0	0	22	155	283	220	94	16	0	0	790	GUNNISON	AVE	0	0	0	0	0	0	9	9	0	0	0	0	18	
	1982	0	0	0	0	3	30	222	246	52	0	0	0	553		1982	0	0	0	0	0	0	11	1	0	0	0	12		
	1983	0	0	0	0	17	52	249						318		1983	0	0	0	0	0	0	16					16		
BUENA VISTA	AVE	0	0	0	0	0	13	37	26	0	0	0	0	76	LAS ANIMAS	AVE	0	0	0	6	53	270	425	344	120	8	0	0	1226	
	1982	0	0	0	0	0	7	36	22	0	0	0	0	65		1982	0	0	0	8	62	145	376	412	133	5	0	0	1141	
	1983	0	0	0	0	0	1	39						40		1983	0	0	0	6	34	201	516					757		
BURLINGTON	AVE	0	0	0	0	26	179	325	253	93	11	0	0	887	LEADVILLE	AVE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1982	0	0	0	0	9	61	316	310	94	2	0	0	792		1982	0	0	0	0	0	0	0	0	0	0	0	0	0	
	1983	0	0	0	0	15	109	360						484		1983	0	0	0	0	0	0	0	0	0	0	0	0	0	
CANON CITY	AVE	0	0	0	0	33	183	329	266	93	15	0	0	919	LIMON	AVE	0	0	0	0	8	97	206	158	39	8	0	0	516	
	1982	0	0	0	0	12	62	326	289	88	0	0	0	777		1982	0	0	0	0	17	174	193	36	0	0	0	420		
	1983	0	0	0	0	10	88	336						434		1983	0	0	0	0	1	36	215					252		
COLORADO SPRINGS	AVE	0	0	0	0	8	99	200	149	45	0	0	0	501	LONGMONT	AVE	0	0	0	0	8	117	227	158	45	0	0	0	555	
	1982	0	0	0	0	0	23	176	127	26	0	0	0	352		1982	0	0	0	1	11	43	216	257	62	0	0	0	590	
	1983	0	0	0	0	1	48	236						285		1983	0	0	0	0	11	82	263					356		
CORTEZ	AVE	0	0	0	0	6	77	214	154	22	0	0	0	473	MEEKER	AVE	0	0	0	0	0	14	87	49	12	0	0	0	162	
	1982	0	0	0	0	0	29	143	154	31	0	0	0	357		1982	0	0	0	0	13	87	88	2	0	0	0	190		
	1983	0	0	0	0	7	22	150						179		1983	0	0	0	0	0	2	79					81		
CRAIG	AVE	0	0	0	0	0	13	82	49	8	0	0	0	152	MONTRORSE	AVE	0	0	0	0	12	120	242	162	45	0	0	0	581	
	1982	0	0	0	0	0	11	84	106	8	0	0	0	209		1982	0	0	0	0	4	84	246	224	43	0	0	0	601	
	1983	0	0	0	0	0	7	83						90		1983	0	0	0	0	11	80	233					324		
DELTA	AVE	0	0	0	0	21	115	282	208	52	0	0	0	678	PAGOSA SPRINGS	AVE	0	0	0	0	0	8	51	27	0	0	0	0	86	
	1982	0	0	0	0	13	120	268	274	51	0	0	0	726		1982	0	0	0	0	0	0	42	50	0	0	0	0	92	
	1983	0	0	0	0	14	74	263						351		1983	0	0	0	0	0	2						2		
DENVER	AVE	0	0	0	0	11	134	261	203	63	8	0	0	680	PUEBLO	AVE	0	0	0	0	39	212	369	295	119	8	0	0	1042	
	1982	0	0	0	0	6	42	247	257	59	0	0	0	611		1982	0	0	0	3	30	123	395	368	110	0	0	0	1029	
	1983	0	0	0	0	7	69	264						340		1983	0	0	0	0	16	120	391					527		
DILLON	AVE	0	0	0	0	0	0	0	0	0	0	0	0	0	RIFLE	AVE	0	0	0	0	0	46	167	117	15	0	0	0	345	
	1982	0	0	0	0	0	0	0	0	0	0	0	0	0		1982	0	0	0	0	0	38	193	205	14	0	0	0	450	
	1983	0	0	0	0	0	0	0						0		1983	0	0	0	0	0	29	178					207		
DURANGO	AVE	0	0	0	0	0	20	111	71	7	0	0	0	209	STEAMBOAT SPRINGS	AVE	0	0	0	0	0	0	11	7	0	0	0	0	18	
	1982	0	0	0	0	0	10	114	122	15	0	0	0	261		1982	0	0	0	0	0	0	12	10	0	0	0	0	22	
	1983	0	0	0	0	1	9	159						169		1983	0	0	0	0	0	0	3					3		
EAGLE	AVE	0	0	0	0	0	9	71	39	0	0	0	0	119	STERLING	AVE	0	0	0	0	15	147	293	214	52	0	0	0	721	
	1982	0	0	0	0	0	6	49	65	0	0	0	0	120		1982	0	0	0	0	3	51	268	279	53	0	0	0	654	
	1983	0	0	0	0	0	1	65						66		1983	0	0	0	0	12	84	301					397		
EVERGREEN	AVE	0	0	0	0	0	2	18	14	0	0	0	0	34	TELLURIDE	AVE	0	0	0	0	0	0	0	0	0	0	0	0	0	
	1982	0	0	0	0	0	0	28						28		1982	0	0	0	0	0	0	3	2	0	0	0	0	5	
	1983	0	0	0	0	0	0									1983	0	0	0	0	0	0	2					2		
FORT COLLINS	AVE	0	0	0	0	5	100	204	132	30	0	0	0	471	TRINIDAD	AVE	0	0	0	0	18	155	279	216	68	5	0	0	741	
	1982	0	0	0	0	1	28	202	214	25	0	0	0	470		1982	0	0	0	3	12	83	306	257	95	0	0	0	756	
	1983	0	0	0	0	8	56	220						284		1983	0	0	0	0	1	100	327					423		
FORT MORGAN	AVE	0	0	0	0	16	155	304	223	62	0	0	0	760	WALDEH	AVE	0	0	0	0	0	0	0	0	0	0	0	0	0	
	1982	0	0	0	4	17	78	325	319	82	0	0	0	825		1982	0	0	0	0	0	2	0	0	0	0	0	0	2	
	1983	0	0	0	0	17	97	341						455		1983	0	0	0	0	0	0	1					1		
GRAHD JUNCTION	AVE	0	0	0	0	58	238	431	338	128	12	0	0	1205	WALSEN-BURG	AVE	0	0	0	0	8	109	219	157	45	0	0	0	538	
	1982	0	0	0	0	33	229	443	415	144	0	0	0	1264		1982	0	0	0	1	1	30	250	211	65	0	0	0	558	
	1983	0	0	0	0	49	171	422						642		1983	0	0	0	0	2	67	266					335		

COLORADO CLIMATE -- AUGUST 1983

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

An extensive and persistent high pressure ridge over the central United States produced hot weather over Colorado in August. Heavy thunderstorms occurred throughout the month in parts of the state. However, monthly precipitation totals were extremely variable.

Significant Highlights -- August

<u>Date</u>	<u>Event</u>
1-7	Hot statewide, with scattered locally heavy thunderstorms every day. Several 24-hour precipitation amounts in excess of one inch. The greatest 24-hour precipitation totals were 2.33" at Red Wing, 2.20" at Marston Treatment Plant (Littleton) and 1.78" at Limon and Genoa all on the 5th and 1.73" at Antero Reservoir on the 7th.
8-10	Continued hot with shower activity mostly light and limited to the mountain areas and southwestern valleys. Many stations in western Colorado experienced their hottest temperatures of the month. Steamboat Springs, 90°F on 8th and 9th. Rifle, 96° on the 8th. Grand Junction 99° on the 8th. Gunnison, 87° on the 9th. Berthoud Pass, 71° on the 9th.
11-18	Hot temperatures persisted as the large high pressure ridge held its position over the central U.S. An increase in moisture occurred again with daily thunderstorm activity over the mountains. More locally heavy rains including 24-hour totals of 2.27" at Marvine Ranch on the 11th, 2.38" near Rush on the 13th and 2.45" and 2.10" on the 14th at Gross Reservoir and Nederland, respectively. The only significant rain during August in parts of southeastern Colorado occurred late on the 13th. Las Animas received 0.83" that evening. Most areas east of the mountains recorded their highest temperatures for the month on the 16th and 17th. Examples included 96° at Trinidad and Greeley, 99° at Springfield and 93° at Denver on the 16th. Limon hit 99° on the 17th. Las Animas and Julesburg shared honors for the hottest temperature in the state with 104° on the 16th.

- 19-24 Not quite so hot. Relatively moist, southwesterly flow over Colorado as large high pressure ridge shifted eastward bringing intense heat and dry weather to the southeastern U.S. Several stations recorded their coolest temperatures of the month on the 24th. Grand Junction, for example, reached 61° and Colorado Springs cooled to 53°.
- 25-26 Continued hot. Widespread shower and thunderstorm activity. Cortez received 1.39" on the 25th.
- 27-31 Warmer than average temperatures continued as a high pressure ridge again dominated the central part of the country. Daily shower activity continued especially over the mountains. A gradual decrease in humidity finally permitted some seasonably chilly nighttime temperatures. Taylor Park Dam dipped to 29°F on the 31st, the coldest temperature of the month in Colorado.

Precipitation Summary

Precipitation totals and percents of average for August are shown in Figures 1 and 2. Precipitation was extremely variable over the state ranging from less than an inch in much of southeastern Colorado, a small area along the Front Range, a portion of the San Luis Valley, and extreme west central Colorado to more than 6 inches in a few mountain locations. Berthoud Pass, for example, totalled 6.68 inches, the greatest on record at that site. Wolf Creek Pass was the wettest location in the state with an August total of 7.21 inches. A few locations east of the mountains also recorded unusually heavy precipitation. Canon City's 4.33" total was 253% of average.

Wetter than average areas included most of the mountains from Durango to Grand Lake, the Grand Mesa, the Arkansas Valley above Pueblo, South Park, the Trinidad area and the Palmer Ridge from Sedalia eastward to Genoa. Dry areas included most of southeastern Colorado, a portion of the San Luis Valley, some Front Range locations included Boulder, Fort Collins, and Greeley, local areas of northeastern Colorado, and spotty locations on the Western Slope.

Water-Year Precipitation to Date

The 1983 water year has been a good one for most of the state in terms of water supplies. Of the 62 weather stations west of the Continental Divide with complete records this year, 55 have been wetter

than average and 24 are more than 40% wetter than average. This readily explains the excellent reservoir storage and the unusually high streamflows experienced this summer. Precipitation in the Platte drainage has also been abundant. Several stations, including Denver, are still more than 50% above average for the year. The only area of concern is the Arkansas Valley. High elevation precipitation has been abundant, but the dryland areas of southeastern Colorado have steadily been drying out. A few stations have received only 70% of their average water-year precipitation.

Temperature Summary

All of Colorado experienced a hot August. Most of the state ended up 3 to 5 degrees above average. Areas of northeastern and extreme eastern Colorado were more than 5 degrees above average. Records were shattered at many locations.

<u>City</u>	<u>Average Temperature August 1983 (°F)</u>	<u>Previous Record</u>	<u>Years of Record</u>
Craig	69.0	67.9 (1936)	48
Eagle	68.3 (tied)	68.3 (1969)	42
Ft. Collins	73.8	72.2 (1937)	95
Ft. Morgan	78.5	75.9 (1970)	87
Grand Junction	80.3	79.5 (1969)	85
Longmont	74.9	73.6 (1937)	75
Meeker	68.7	67.8 (1971)	44
Sterling	77.5	75.8 (1937)	74
Walden	61.1	59.4 (1947)	46

High humidity accompanied the heat making August one of the more uncomfortable months in memory compared to Colorado standards.

Degree Days

Heating degree days were much below average and cooling degrees days much above average due to the August heat. Specific information is contained in Tables 1 and 2.

Figure 1. August 1983 precipitation amounts (inches).

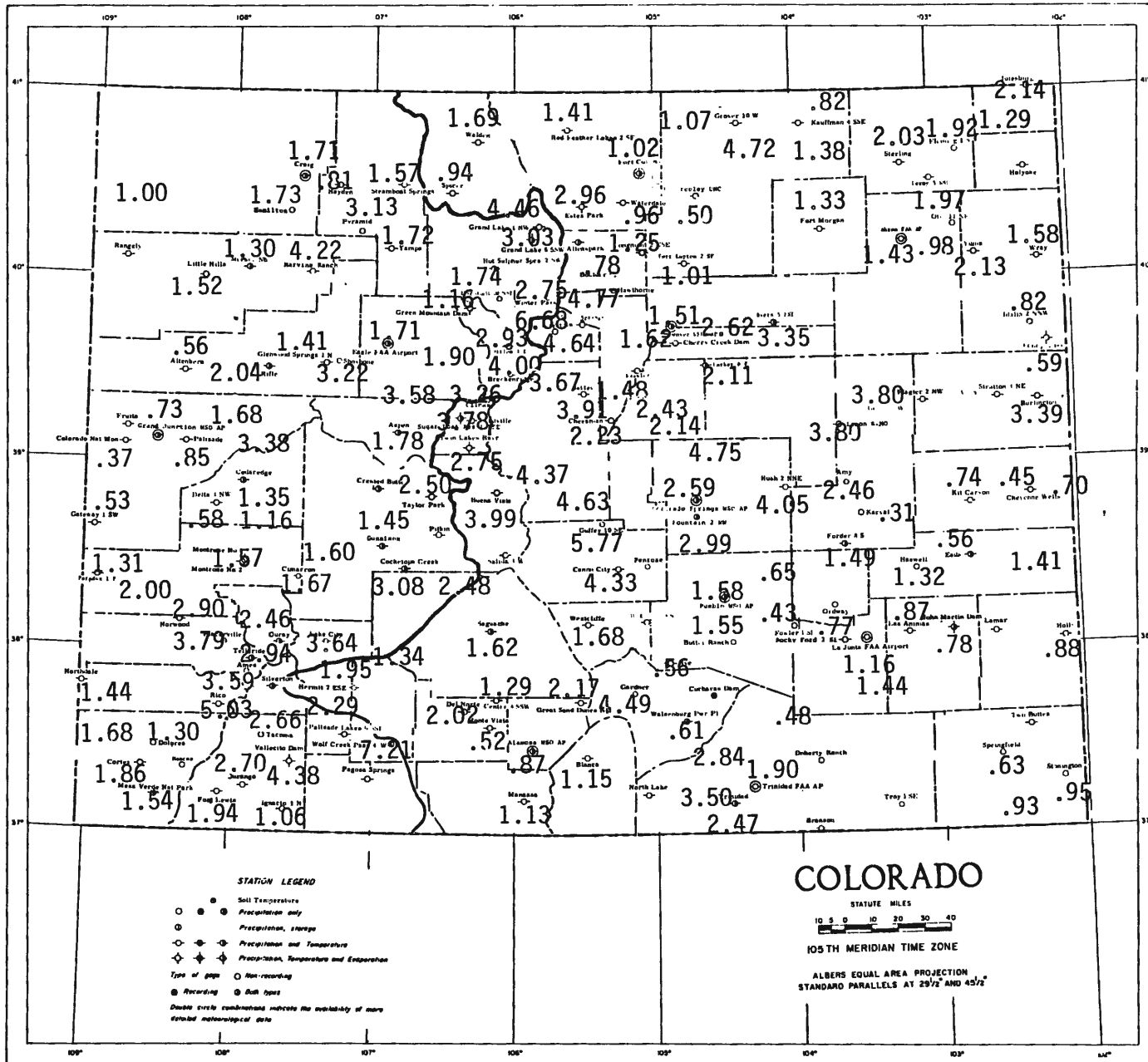


Figure 2. Precipitation for August 1983 as a percent of the 1961-1980 average.

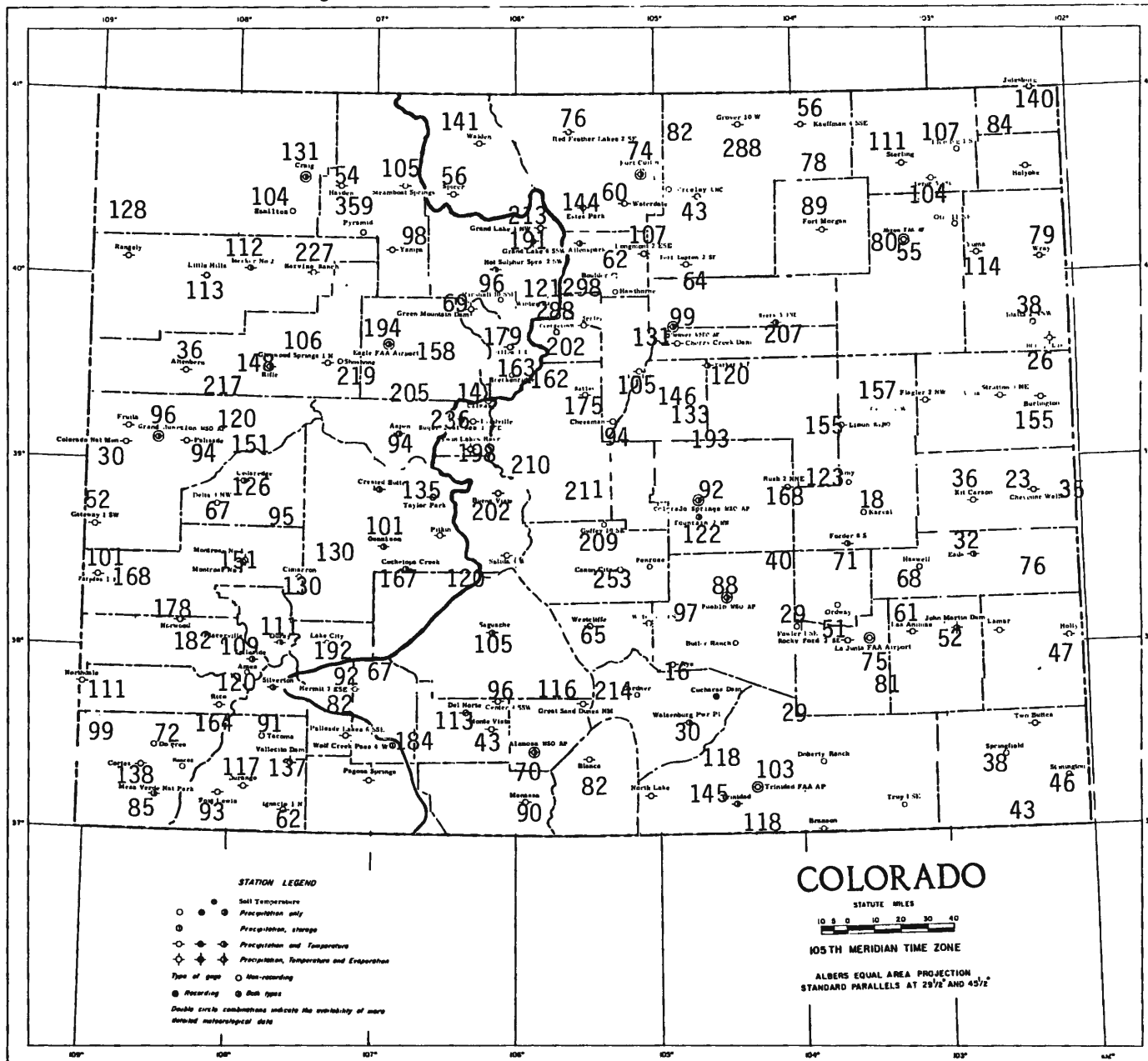


Figure 3. Precipitation for October 1982 through August 1983 as a percent of the 1961-1980 average.

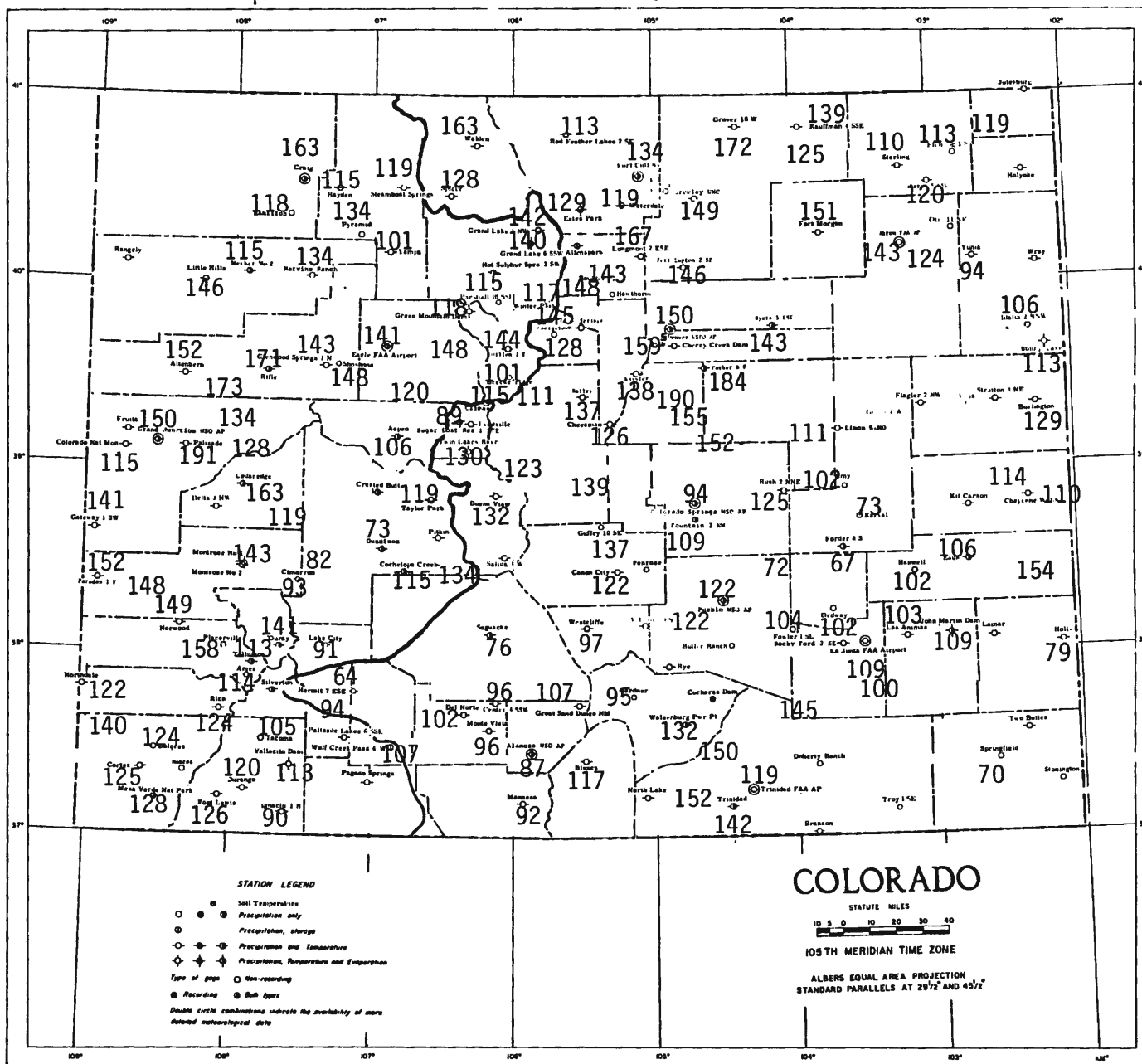


Figure 4. Temperatures for August 1983 in degrees Fahrenheit (in parentheses) and departures from the 1961-1980 average.

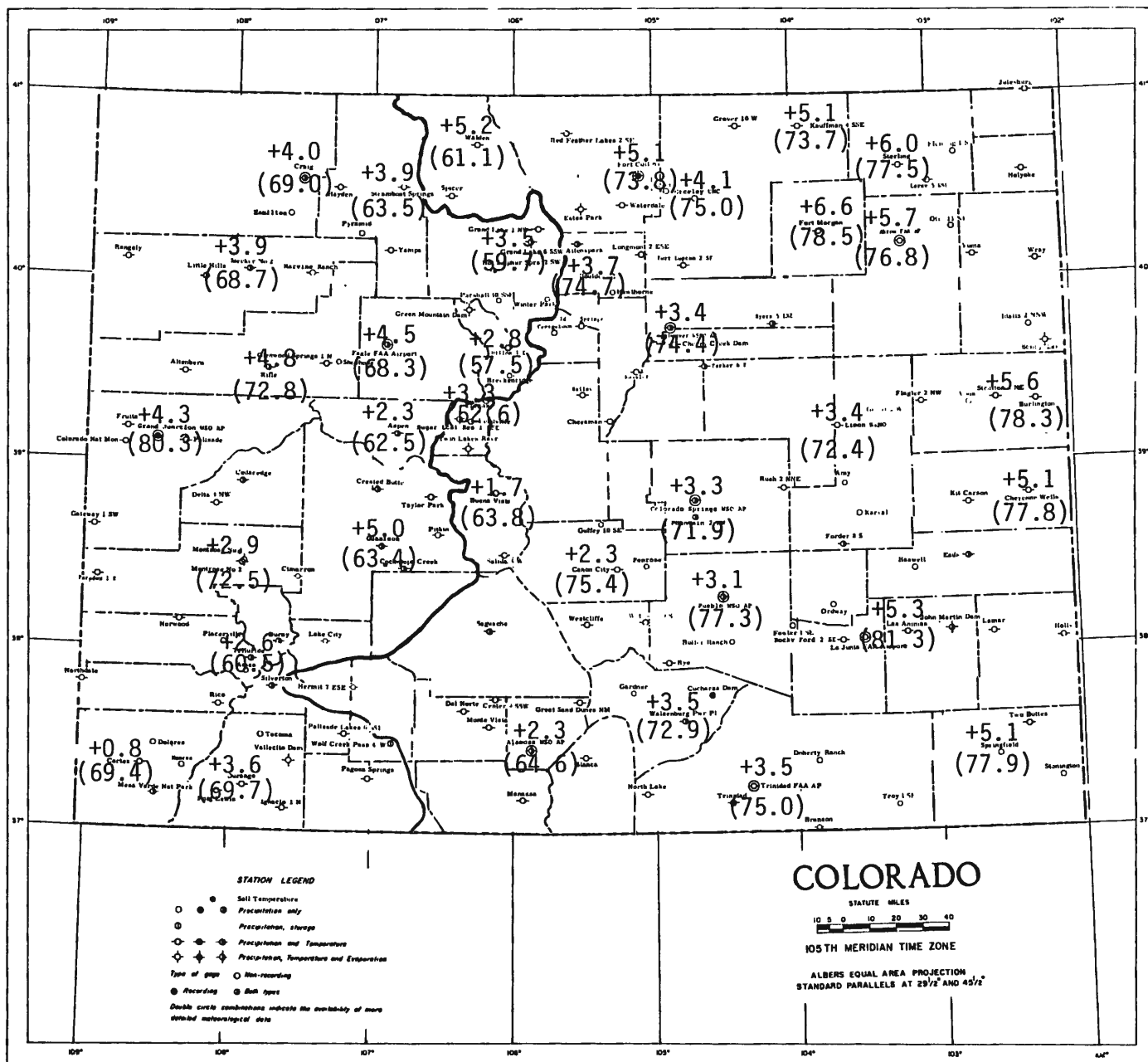


Table 1. Colorado Heating Degree Day Data through August 1983.

STATION		JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	ANN	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	GRAND LAKE	AVE	214	264	468	775	1128	1473	1593	1369	1318	951	654	384	10591
	82-83	59	47	274	714	1016	1361	1380	1080	945	856	556	249	8537		82-83	254	180	452	878	1236	1505	1489	1280	1219	1157	803	443	10896
	83-84	28	35											63		83-84	233	156										389	
ASPEN	AVE	95	150	348	651	1029	1339	1376	1162	1116	798	524	262	8850	GREELEY	AVE	0	0	149	450	861	1128	1240	946	856	522	238	52	6442
	82-83	148	119	362	808	1105	1326	1301	1095	1066	959	691	350	9330		82-83	5	0	154	478	888	1075	988	770	806	688	379	113	6344
	83-84	97	86											183		83-84	3	0										3	
BOULDER	AVE	0	6	130	357	714	908	1004	804	775	483	220	59	5460	GUNNISON	AVE	111	188	393	719	1119	1590	1714	1422	1231	816	543	276	10122
	82-83	4	0	154	442	769	913	963	819	811	639	380	120	6014		82-83	132	89	374	778	1146	1394	1379	1118	990	925	612	318	9255
	83-84	4	0											4		83-84	75	60										135	
BUENA VISTA	AVE	47	116	285	577	936	1184	1218	1025	983	720	459	184	7734	LAS ANIMAS	AVE	0	0	45	296	729	998	1012	820	698	348	102	9	5146
	82-83	47	70	284	745	998	1160	1105	995	990	897	547	266	7904		82-83	0	0	43	313	758	978	1012	747	682	481	198	18	5230
	83-84	45	49											94		83-84	0	0										0	
BURLINGTON	AVE	6	5	108	364	762	1017	1110	871	803	459	200	38	5743	LEADVILLE	AVE	272	337	522	817	1173	1435	1473	1318	1320	1038	726	439	10870
	82-83	0	5	99	405	818	999	1006	784	832	637	339	81	6005		82-83	323	323	540	974	1260	1426	1399	1259	1301	1220	886	544	11132
	83-84	0	0											0		83-84	308	316										624	
CANON CITY	AVE	0	9	81	301	639	831	911	734	707	411	179	33	4836	LIMON	AVE	8	6	144	448	834	1070	1156	960	936	570	299	100	6531
	82-83	3	6	109	391	745	890	829	711	726	579	302	85	5376		82-83	18	5	184	539	936	1124	1077	898	935	792	464	166	7138
	83-84	0	0											0		83-84	7	0										7	
COLORADO SPRINGS	AVE	8	25	162	440	819	1042	1122	910	880	564	296	78	6346	LONGMONT	AVE	0	6	162	453	843	1082	1194	938	874	546	256	78	6432
	82-83	8	11	198	532	880	1084	1001	851	904	742	444	159	6814		82-83	7	0	164	517	894	1087	1001	809	836	664	406	128	6513
	83-84	2	0											2		83-84	1	0										1	
CORTEZ	AVE	0	11	115	434	813	1132	1181	921	828	555	292	68	6350	MEEKER	AVE	28	56	261	564	927	1240	1345	1086	998	651	394	164	7714
	82-83	17	5	132	606	856	1148	1168	939	878	723	438	131	7041		82-83	33	7	245	657	998	1225	1157	1010	901	806	498	199	7736
	83-84	5	0											5		83-84	12	2										14	
CRAIG	AVE	32	58	275	608	996	1342	1479	1193	1094	687	419	193	8376	MONTRORSE	AVE	0	10	135	437	837	1159	1218	941	818	522	254	69	6400
	82-83	37	5	271	752	1116	1361	1305	1130	989	847	561	228	8602		82-83	4	2	111	556	846	1104	1094	828	759	620	347	89	6360
	83-84	41	3											44		83-84	0	0										0	
DELTA	AVE	0	0	94	394	813	1135	1197	890	753	429	167	31	5903	PAGOSA SPRINGS	AVE	82	113	297	608	981	1305	1380	1123	1026	732	487	233	8367
	82-83	2	4	81	496	777	1043	1040	753	686	513	272	66	5733		82-83	76	29	253	732	938	1338	1274	1013	943	819	565	286	8266
	83-84	0	0											0		83-84	51											51	
DENVER	AVE	0	0	135	414	789	1004	1101	879	837	528	253	74	6014	PUEBLO	AVE	0	0	89	346	744	998	1091	834	756	421	163	23	5465
	82-83	3	0	151	487	875	1050	1017	789	885	712	419	129	6517		82-83	0	0	63	427	794	1010	974	833	740	561	258	50	5710
	83-84	3	0											3		83-84	0	0										0	
DILLON	AVE	273	332	513	806	1167	1435	1516	1305	1296	972	704	435	10754	RIFLE	AVE	6	24	177	499	876	1249	1321	1002	856	555	298	82	6945
	82-83	318	253	511	959	1235	1450	1418	1265	1227	1158	842	496	11132		82-83	8	3	150	596	871	1129	1082	833	738	669	394	107	6580
	83-84	263	224											487		83-84	3	0										3	
DURANGO	AVE	9	34	193	493	837	1153	1218	958	862	600	366	125	6848	STEAMBOAT SPRINGS	AVE	113	169	390	704	1101	1476	1541	1277	1184	810	533	297	9595
	82-83	24	6	175	614	874	1197	1130	909	850	735	405	147	7066		82-83	146	80	368	791	1183	1482	1446	1146	1024	939	618	333	9556
	83-84	3	0											3		83-84	120	61										181	
EAGLE	AVE	33	80	288	626	1026	1407	1448	1148	1014	705	431	171	8377	STERLING	AVE	0	6	157	462	876	1163	1274	956	896	528	235	51	6614
	82-83	54	21	257	720	1059	1350	1273	974	880	846	529	219	8182		82-83	3	3	154	518	933	1098	1046	762	827	674	363	111	6492
	83-84	30	3											33		83-84	1	0										1	
EVERGREEN	AVE	59	113	327	621	916	1135	1199	1011	1009	730	489	218	7827	TELLURIDE	AVE	163	223	396	676	1026	1293	1339	1151	1141	849	589	318	9164
	82-83	110	41	339	733	1032	1184	940	979	1056	961	694	324	8393		82-83	139	140	364	746	1022	1265	1195	1042	1036	956	620	355	8880
	83-84	72												72		83-84	108	130										238	
FORT COLLINS	AVE	5	11	171	468	846	1073	1181	930	977	558	281	42	6483	TRINIDAD	AVE	0	0	86	359	738	973	1051	846	781	468	207	35	5544
	82-83	4	0	178	509	925	1082	968	737	930	715	389	127	6514		82-83	0	0	66	367	705	949	956	779	730	619	318	66	5555
	83-84	2	0											2		83-84	0	0										0	
FORT MORGAN	AVE	0	6	140	438	867	1156	1283	959	974	516	224	47	6520	WALOEN	AVE	198	285	501	822	1170	1457	1535	1313	1277	915	642	351	10466
	82-83	3	3	123	492	895	1086	1050	804	798	663	346	108	6371															

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

STATION		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN	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	GRAND LAKE	AVE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1982	0	0	0	0	0	0	38	27	0	0	0	0	65		1982	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1983	0	0	0	0	0	4	43	30					77		1983	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ASPEN	AVE	0	0	0	0	0	7	18	11	0	0	0	0	36	GREELEY	AVE	0	0	0	0	15	130	267	185	50	0	0	0	0	647	
	1982	0	0	0	0	0	6	2	0	0	0	0	8	1982		0	0	0	4	3	41	232	259	42	0	0	0	0	581		
	1983	0	0	0	0	0	0	11	13					24		1983	0	0	0	0	5	83	257	319					664		
BOULDER	AVE	0	0	0	0	22	155	283	220	94	16	0	0	790	GUNNISON	AVE	0	0	0	0	0	0	9	9	0	0	0	0	19		
	1982	0	0	0	0	3	30	222	246	52	0	0	0	553		1982	0	0	0	0	0	0	11	1	0	0	0	0	12		
	1983	0	0	0	0	17	52	249	309					627		1983	0	0	0	0	0	0	16	16					32		
BUENA VISTA	AVE	0	0	0	0	0	13	37	26	0	0	0	0	76	LAS ANIMAS	AVE	0	0	0	6	53	270	425	344	120	8	0	0	1226		
	1982	0	0	0	0	0	7	36	22	0	0	0	0	65		1982	0	0	0	8	62	145	376	412	133	5	0	0	1131		
	1983	0	0	0	0	0	1	39	22					62		1983	0	0	0	6	34	201	516	512					1269		
BURLINGTON	AVE	0	0	0	0	26	179	325	253	93	11	0	0	887	LEADVILLE	AVE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	1982	0	0	0	0	9	61	316	310	94	2	0	0	792		1982	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	1983	0	0	0	0	15	109	360	420					904		1983	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
CANON CITY	AVE	0	0	0	0	33	183	329	266	93	15	0	0	919	LIMON	AVE	0	0	0	0	8	97	206	158	39	8	0	0	516		
	1982	0	0	0	0	12	82	326	289	88	0	0	0	777		1982	0	0	0	0	0	17	174	193	36	0	0	0	420		
	1983	0	0	0	0	10	88	336	328					762		1983	0	0	0	0	1	36	215	239					491		
COLORADO SPRINGS	AVE	0	0	0	0	8	99	200	149	45	0	0	0	501	LONGMONT	AVE	0	0	0	0	8	117	227	158	45	0	0	0	555		
	1982	0	0	0	0	0	23	176	127	26	0	0	0	352		1982	0	0	0	1	11	43	216	257	62	0	0	0	590		
	1983	0	0	0	0	1	48	236	219					504		1983	0	0	0	0	11	82	263	315					671		
CORTEZ	AVE	0	0	0	0	6	77	214	154	22	0	0	0	473	MEEKER	AVE	0	0	0	0	0	14	87	49	12	0	0	0	162		
	1982	0	0	0	0	0	29	143	154	31	0	0	0	357		1982	0	0	0	0	0	13	87	88	2	0	0	0	190		
	1983	0	0	0	0	7	22	150	169					348		1983	0	0	0	0	0	2	79	127					208		
CRAIG	AVE	0	0	0	0	0	13	82	49	8	0	0	0	152	MONTROSE	AVE	0	0	0	0	12	120	242	162	45	0	0	0	581		
	1982	0	0	0	0	0	11	84	106	8	0	0	0	209		1982	0	0	0	0	4	84	246	224	43	0	0	0	601		
	1983	0	0	0	0	0	7	83	134					224		1983	0	0	0	0	11	80	233	240					564		
DELTA	AVE	0	0	0	0	21	115	282	208	52	0	0	0	678	PAGOSA SPRINGS	AVE	0	0	0	0	0	8	51	27	0	0	0	0	86		
	1982	0	0	0	0	13	120	268	274	51	0	0	0	726		1982	0	0	0	0	0	0	42	50	0	0	0	0	92		
	1983	0	0	0	0	14	74	263	328					679		1983	0	0	0	0	0	2	35						2		
DENVER	AVE	0	0	0	0	11	134	261	203	63	8	0	0	680	PUEBLO	AVE	0	0	0	0	39	212	369	295	119	8	0	0	1042		
	1982	0	0	0	0	6	42	247	257	59	0	0	0	611		1982	0	0	0	3	30	123	395	368	110	0	0	0	1029		
	1983	0	0	0	0	7	69	264	301					641		1983	0	0	0	0	16	120	391	391					918		
DILLON	AVE	0	0	0	0	0	0	0	0	0	0	0	0	0	RIFLE	AVE	0	0	0	0	0	46	167	117	15	0	0	0	345		
	1982	0	0	0	0	0	0	0	0	0	0	0	0	0		1982	0	0	0	0	0	38	193	205	14	0	0	0	450		
	1983	0	0	0	0	0	0	0	0					0		1983	0	0	0	0	0	29	178	249					456		
DURANGO	AVE	0	0	0	0	0	20	111	71	7	0	0	0	209	STEAMBOAT SPRINGS	AVE	0	0	0	0	0	0	11	7	0	0	0	0	18		
	1982	0	0	0	0	0	10	114	122	15	0	0	0	261		1982	0	0	0	0	0	0	12	10	0	0	0	0	22		
	1983	0	0	0	0	1	9	159	152					321		1983	0	0	0	0	0	0	3	21					24		
EAGLE	AVE	0	0	0	0	0	9	71	39	0	0	0	0	119	STERLING	AVE	0	0	0	0	15	147	293	214	52	0	0	0	721		
	1982	0	0	0	0	0	6	49	65	0	0	0	0	120		1982	0	0	0	0	3	51	268	279	53	0	0	0	654		
	1983	0	0	0	0	0	1	65	112					178		1983	0	0	0	0	12	84	301	398					795		
EVERGREEN	AVE	0	0	0	0	0	2	18	14	0	0	0	0	34	TELLURIOE	AVE	0	0	0	0	0	0	0	0	0	0	0	0	0		
	1982	0	0	0	0	0	0	28						28		1982	0	0	0	0	0	0	3	2	0	0	0	0	5		
	1983	0	0	0	0	0	0	0						28		1983	0	0	0	0	0	0	2	1					3		
FORT COLLINS	AVE	0	0	0	0	5	100	204	132	30	0	0	0	471	TRINIDAD	AVE	0	0	0	0	18	155	279	216	68	5	0	0	741		
	1982	0	0	0	0	1	28	202	214	25	0	0	0	470		1982	0	0	0	3	12	83	306	257	95	0	0	0	756		
	1983	0	0	0	0	8	56	220	281					565		1983	0	0	0	0	1	100	327	319					747		
FORT MORGAN	AVE	0	0	0	0	16	155	304	223	62	0	0	0	760	WALDEN	AVE	0	0	0	0	0	0	0	0	0	0	0	0	0		
	1982	0	0	0	4	17	78	325	319	82	0	0	0	825		1982	0	0	0	0	0	0	2	0	0	0	0	0	2		
	1983	0	0	0	0	17	97	341	424					879		1983	0	0	0	0	0	0	1	2					3		
GRAND JUNCTION	AVE	0	0	0	0	58	238	431	338	128	12	0	0	1205	WALSENBURG	AVE	0	0	0	0	8	109	219	157	45	0	0	0	538		
	1982	0	0	0	0	33	229	443	415	144	0	0	0	1264		1982	0	0	0	1	1	30	250	211	65	0	0	0	558		
	1983	0	0	0	0	49	171	422	483					1125		1983	0	0	0	0	2	67	266	250					585		

COLORADO CLIMATE -- SEPTEMBER 1983

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

Most of September was dry and unseasonably warm across all of Colorado. Despite the warmth, the growing season ended prematurely as a sharp blast of cold weather produced a statewide freeze on the 20th.

Significant Highlights -- September

<u>Date</u>	<u>Event</u>
1-3	August heat continued. Some scattered thundershower activity--mostly light. Near record high temperatures on the 1st and 2nd. Mid 90's and 100's common at lower elevations. Boulder's 100°F on the 2nd was a new record for the month. The 99°F reading at Fort Morgan matched their previous September record. Holly and Las Animas shared honors with the hottest temperature for the month--104°F on the 2nd.
4	Upper air disturbance and associated cold front triggered shower activity over most of the state. Precipitation amounts mostly light. Exceptions were the 1.38" and 1.27" totals at Eads and Kit Carson, respectively.
5-6	Dry with seasonal temperatures.
7-11	More unusually hot weather. Rangley hit 93° and Eagle reached 90° on the 7th. Just a few very widely scattered light afternoon thundershowers near and west of the mountains.
12-13	Cooler east of the mountains. Highs only in the 60's in extreme southeastern Colorado with low clouds and light rain. First fall freeze for some mountain locations such as Dillon--much later than usual.
14-15	Fast moving Pacific cold front zipped in from the Northwest. Some scattered showers and a few flakes of snow in the higher mountains.
16-18	Dry and warm. Daytime temperatures in the 80's and 90's except in the mountains.
19	Extremely strong arctic cold front crossed Colorado during the day. Shower activity, mostly over the northern half of

the state, gave way to a teasing of snow flakes in the mountains and along the Front Range. Heaviest snowfalls reported were 0.5" at Greeley and 1" on Berthoud Pass. Temperatures east of the mountains plummeted from midday readings in the 80's and 90's to late evening values below freezing. At Bonny Lake the temperature fell from a high of 97° to a low of 28° the next morning.

- 20-22 Cold statewide. Clouds east of the mountains on the 20th gradually cleared and the remainder of the period was clear and very cold for so early in the season. The growing season came to an abrupt halt as the entire state experienced a hard freeze with temperatures mostly in the teens and 20's. The Grand Junction area was the only major valley to escape the early freeze. Examples of unusually low temperatures included: 30° at Trinidad and Montrose on the 21st. 26° at Colorado Springs, Boulder, Fort Collins and Rocky Ford also on the 21st. 23° at Holly, 20° at Sterling and 16° at New Raymer, all on the 21st. As usual, Taylor Park Dam was the coldest in the state with 10°F on the 21st.
- 23-30 Temperatures quickly rebounded to warmer than average values statewide. Dry east of the mountains but a steady southwesterly flow of moist air resulted in scattered showers over the mountains and western valleys. Precipitation became very heavy in the San Juan mountains on the 29th and 30th. 24-hour totals ending on the 30th included 1.45" at Durango, 2.10" at Vallecito Dam and 3.10" at Wolf Creek Pass. This was all a part of the same weather system of tropical origin which produced the severe flooding in Arizona.

Precipitation Summary

Precipitation totals and percents of average for September are shown in Figures 1 and 2. Totals ranged from 0 at several Eastern Plains sites to 6.09" at Wolf Creek Pass. As a whole, areas east of the mountains only received about 25% of the average September precipitation. Notable exceptions occurred in portions of Logan, Cheyenne, and Kiowa counties where precipitation was about average. Denver's 0.13" of rainfall was only 9% of average. Julesburg, Yuma, Flagler, and Las Animas recorded no measurable precipitation.

Broad areas of western Colorado were also unusually dry. Over the entire drainages of the Yampa, White, Colorado and Gunnison rivers precipitation was only about 50% of average. There were a few damp areas, however. Above average precipitation was observed in extreme

western and southwestern portions of the state. Del Norte was the wettest location compared to average with a total of 2.18", 216% of normal.

Temperature Summary

Despite the record cold outbreak in mid September, the month ended up much warmer than average (Figure 3). Monthly temperatures were 2 to 3 degrees F above average in the mountains and along the Front Range. Northeastern Colorado was about 4 degrees above average. The Western Valleys were 4 to 5 degrees warmer than usual. Southeastern Colorado was the warmest of all with temperatures ending up more than 5 degrees above average.

Degree Days

Tables 1 and 2 contain specific information on heating and cooling degree days for selected Colorado locations.

Summary of 1983 Summer Precipitation

Precipitation as a percent of average for the May-September growing season period is shown in Figure 4. With a wet start and a dry finish, most areas east of the Divide ended up near average. Local wet spots included the upper Arkansas Valley and Front Range areas from Castle Rock to Longmont. Dry zones included the lower Arkansas Valley and extreme eastern Colorado where a few sites received only half their average summer precipitation.

West of the Divide, summer precipitation was abundant. Gunnison was about the only dry spot with 3.91" of rain since May 1, 81% of average. Most other areas were more than 30% above average. Some of the wettest areas were: Wolf Creek Pass 145% (21.35"), Berthoud Pass 169% (20.98"), Pyramid 181% (13.52"), Rifle 204% (9.40"), Grand Junction 208% (6.98"), and Palisade 211% (8.84").

1983 Water Year Summary

Most of the state enjoyed (and in a few cases suffered from) abundant precipitation during the 1983 water year. For the second year

in a row, totals were well above average across large portions of Colorado including most of the mountains. The wettest areas, compared to average, included most of Garfield, Mesa, Delta, Montrose, and San Miguel counties where annual totals were generally 50% above average. Another large wet area covered the mountainous areas from Vail to Berthoud Pass and then northward toward the Wyoming border. The Platte drainage from the Divide eastward to Akron was also much wetter than normal. The weather station near Sedalia, for example, totalled 27.59" for the year, 174% of average. Denver Stapleton Airport totalled 20.81", the greatest since 1973.

As always, there were some dry areas. The immediate Gunnison vicinity, the central portion of the San Luis Valley, extreme northeastern Colorado and a fairly broad area of southeastern Colorado all received less than 90% of their average water-year precipitation.

Berthoud Pass, with a total of 50.35" for the year, was the wettest station in Colorado with complete 12-month statistics. Palisade was the wettest site relative to their average with a water year total of 16.69" (181% of average). The driest location was Manassa in the San Luis Valley where only 6.26" of precipitation fell.

Temperatures took a real roller coaster ride during the water year--unusually cold October-December, very mild January-mid March, abnormally cold mid-March through June, and finally warmer than average through the end of the summer. For the year as a whole, temperatures were about one degree Fahrenheit cooler than average over the Central Mountains and the eastern foothills and adjacent plains from Pueblo to Denver. The remainder of the state was warmer than average. The only areas more than one degree above average were some of the valleys on the Western Slope. Grand Junction, for example averaged 2.0 degrees above the 1961-1980 annual mean. Gunnison was 3.1 degrees warmer than average.

The hottest daily temperature during the year was 106° at Las Animas on July 10. The coldest temperature reported was -38° on February 3rd at Taylor Park Dam. The difference between extremes, 144 degrees, was less than usual.

State water supplies were already in excellent shape at the beginning of the 1983 water year, and they just got better. Heavy spring precipitation and delayed snowmelt followed by a great deal of summer precipitation in the mountains worked together to produce very large streamflows, approaching record values, on many of the state's major rivers. Rivers peaked in late June, causing widespread lowland flooding, but continued to flow at unusual rates throughout the summer. Final volume flow rate information on all Colorado rivers will be available from the U.S. Geological Survey.

As of October 1, 1983 overall state water supplies continue to be excellent. Reservoir storage is even higher than last year at this time. Even if a dry winter were to occur, surface water supplies should be adequate for next year in most major watersheds with significant reservoir storage capacities. The picture is not so optimistic for Colorado's dryland agricultural areas. While agricultural production was very good this year, even with the late spring and the early fall freeze, soil moisture has been substantially depleted during the last two months of hot, dry weather on the plains. The situation is particularly critical in southeastern Colorado where summer precipitation was only about half of average and temperatures were much above average. This area will bear a close watch in the months ahead.

Figure 1. September 1983 precipitation amounts (inches).

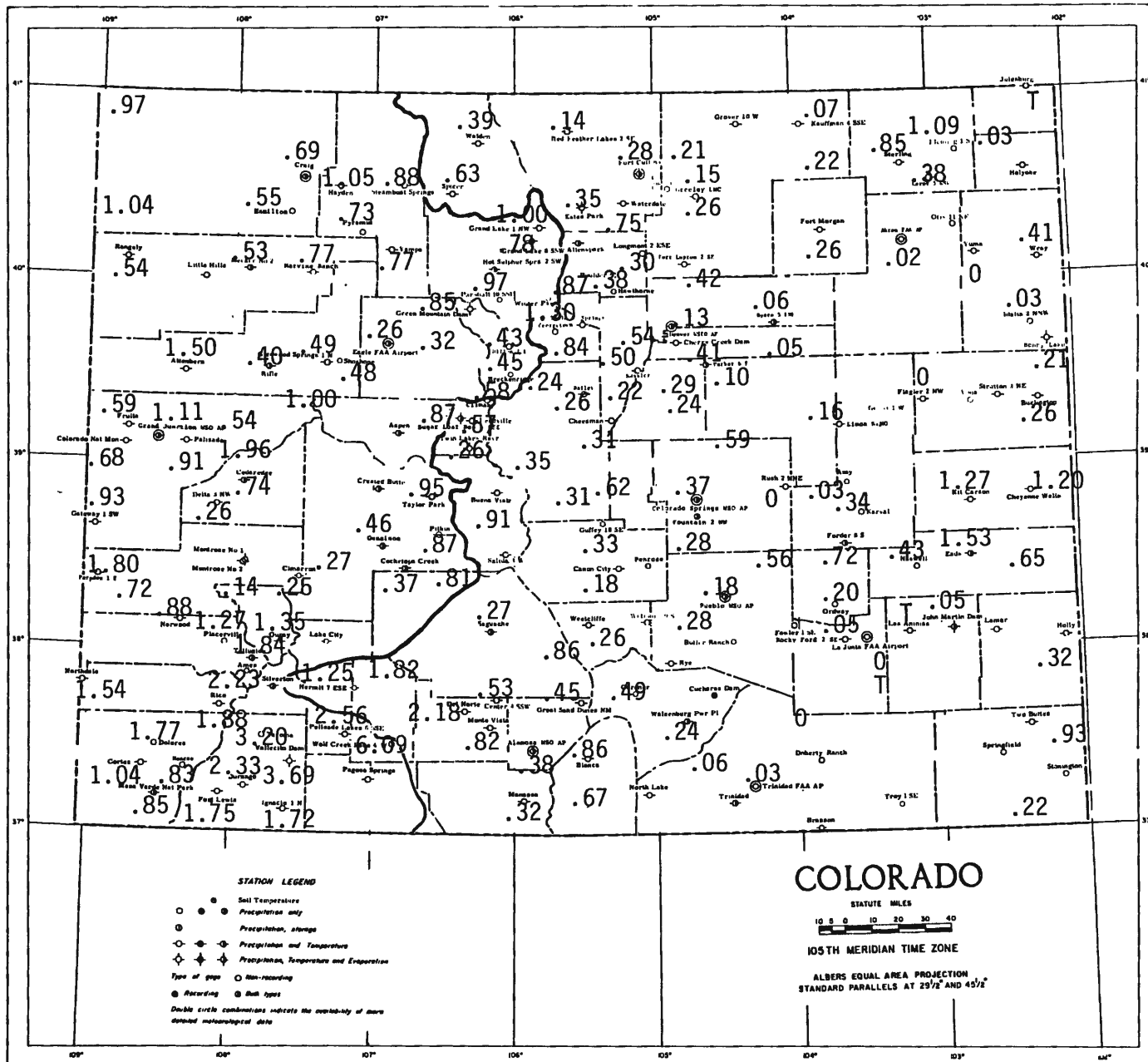


Figure 2. Precipitation for September 1983 as a percent of the 1961-1980 average.

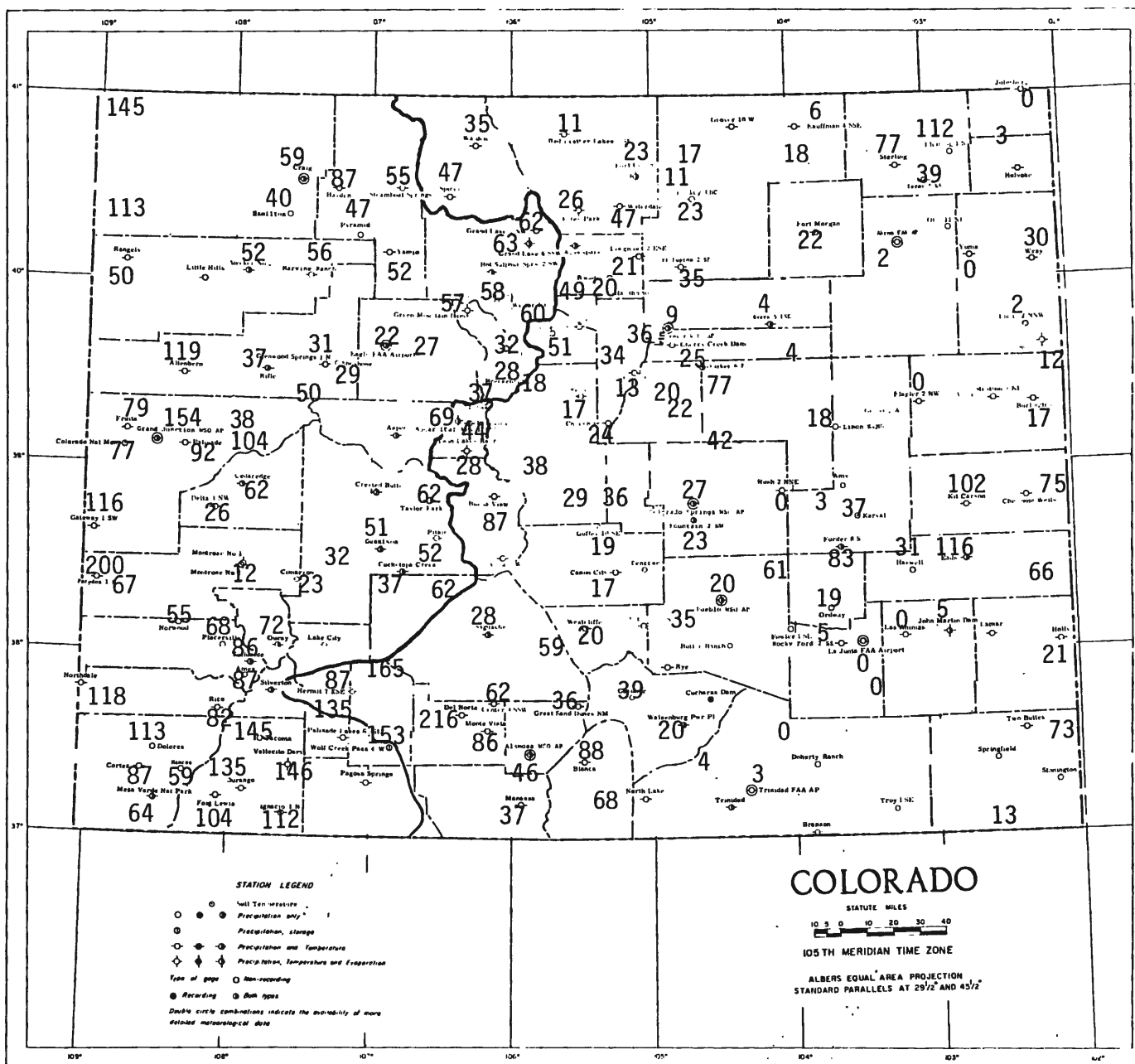


Figure 5. Precipitation for the complete 1983 water-year (October 1982 through September 1983) as a percent of the 1961-1980 average.

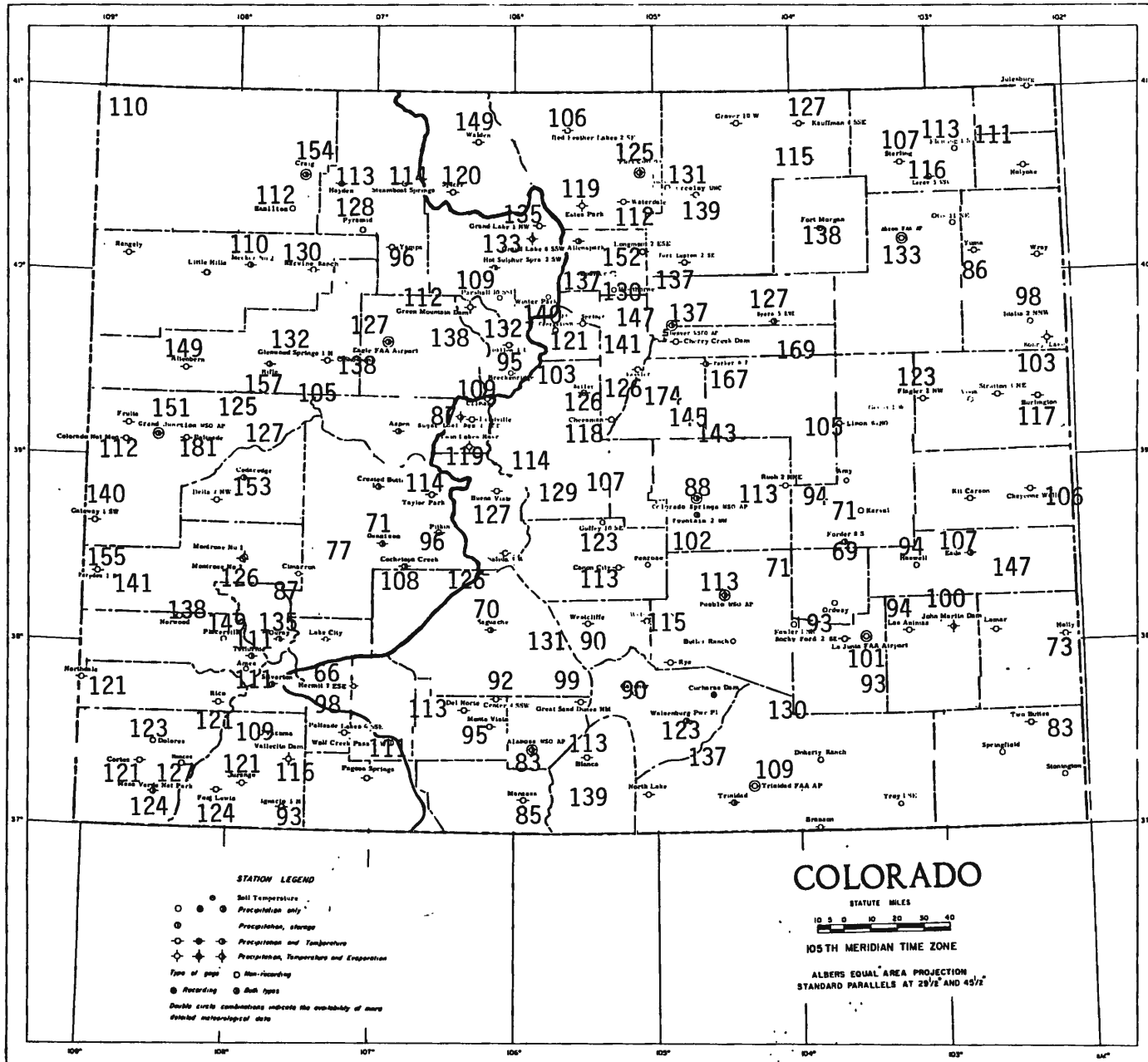


Table 1. Colorado Heating Degree Day Data through September 1983.

HEATING DEGREE DATA													HEATING DEGREE DATA																
STATION		JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	ANN	STATION		JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	ANN
ALAMOSA	AVE	0	100	303	657	1074	1457	1519	1182	1035	732	453	165	8717	GRAND LAKE	AVE	214	264	468	775	1128	1473	1593	1369	1318	951	654	384	10591
	82-83	59	47	274	714	1016	1361	1380	1080	945	856	556	249	8537		82-83	254	180	452	878	1236	1505	1489	1280	1219	1157	803	443	10896
	83-84	28	35	213										276		83-84	233	156	400									789	
ASPEN	AVE	95	150	348	651	1029	1339	1376	1162	1116	798	524	262	8850	GREELEY	AVE	0	0	149	450	861	1128	1240	946	856	522	238	52	6442
	82-83	148	119	362	808	1105	1326	1301	1095	1066	959	691	350	9330		82-83	5	0	154	478	888	1075	988	770	806	688	379	113	6442
	83-84	97	86											183		83-84	3	0	72									75	
BOULDER	AVE	0	6	130	357	714	908	1004	804	775	483	220	59	5460	GUNNISON	AVE	111	188	393	719	1119	1590	1714	1422	1231	816	543	276	10122
	82-83	4	0	154	442	769	913	963	819	811	639	380	120	6014		82-83	132	89	374	778	1146	1394	1379	1118	990	925	612	318	9255
	83-84	4	0	84										88		83-84	75	60	299									434	
BUENA VISTA	AVE	47	116	285	577	936	1184	1218	1025	983	720	459	184	7734	LAS ANIMAS	AVE	0	0	45	296	729	998	1101	820	698	348	102	9	5146
	82-83	47	70	284	745	798	1160	1105	995	990	897	547	266	7904		82-83	0	0	43	313	758	978	1012	747	682	481	198	18	5230
	83-84	45	49	234										328		83-84	0	0	25									25	
BURLINGTON	AVE	6	5	108	364	762	1017	1110	871	803	459	200	38	5743	LEADVILLE	AVE	272	337	522	817	1173	1435	1473	1318	1320	1038	726	439	10870
	82-83	0	5	99	405	818	999	1006	784	832	637	339	81	6005		82-83	323	340	540	974	1260	1426	1399	1259	1301	1220	886	544	11132
	83-84	0	0	87										87		83-84	308	316	488									1112	
CANON CITY	AVE	0	9	81	301	639	831	911	734	707	411	179	33	4836	LIMON	AVE	8	6	144	448	834	1070	1156	960	936	570	299	100	6531
	82-83	3	6	109	391	745	890	829	711	726	579	302	85	5376		82-83	18	5	184	539	936	1124	1077	898	935	792	464	166	7138
	83-84	0	0	71										71		83-84	7	0	109									116	
COLORADO SPRINGS	AVE	8	25	162	440	819	1042	1122	910	880	564	296	78	6346	LONGMONT	AVE	0	6	162	453	843	1082	1194	938	874	546	256	78	6432
	82-83	8	11	198	532	880	1084	1001	851	904	742	444	159	6814		82-83	7	0	164	517	894	1087	1001	809	836	664	406	128	6513
	83-84	2	0	101										103		83-84	1	0	91									92	
CORTEZ	AVE	0	11	115	434	813	1132	1181	921	828	555	292	68	6350	MEEKER	AVE	28	56	261	564	927	1240	1345	1086	998	651	394	164	7714
	82-83	17	5	132	606	856	1148	1168	939	878	723	438	131	7041		82-83	33	7	245	657	998	1225	1157	1010	901	806	498	199	7736
	83-84	5	0	98										103		83-84	12	2	145									159	
CRAIG	AVE	32	58	275	608	996	1342	1479	1193	1094	687	419	193	8376	MONTROSE	AVE	0	10	135	437	837	1159	1218	941	818	522	254	69	6400
	82-83	37	5	271	752	1116	1361	1305	1130	989	847	561	228	8602		82-83	4	2	111	556	846	1104	1094	828	759	620	347	89	6360
	83-84	41	3	212										256		83-84	0	0	73									73	
DELTA	AVE	0	0	94	394	813	1135	1197	890	753	429	167	31	5903	PAGOSA SPRINGS	AVE	82	113	297	608	981	1305	1380	1123	1026	732	487	233	8367
	82-83	2	4	81	496	777	1043	1040	753	686	513	272	66	5733		82-83	76	29	253	732	938	1338	1274	1013	943	819	565	286	8266
	83-84	0	0	60										60		83-84	51	10										51	
DENVER	AVE	0	0	135	414	789	1004	1101	879	837	528	253	74	6014	PUEBLO	AVE	0	0	89	346	744	998	1091	834	756	421	163	23	5465
	82-83	3	0	151	487	875	1050	1017	789	885	712	419	129	6517		82-83	0	0	63	427	794	1010	974	833	740	561	258	50	5710
	83-84	3	0	87										90		83-84	0	0	52									52	
DILLON	AVE	273	332	513	806	1167	1435	1516	1305	1296	972	704	435	10754	RIFLE	AVE	6	24	177	499	876	1249	1321	1002	856	555	298	82	6945
	82-83	318	253	511	959	1235	1450	1418	1265	1227	1158	842	496	11132		82-83	8	3	150	596	871	1129	1082	833	738	669	394	107	6580
	83-84	263	224	438										925		83-84	3	0	86									89	
DURANGO	AVE	9	34	193	493	837	1153	1218	958	862	600	366	125	6848	STEAMBOAT SPRINGS	AVE	113	169	390	704	1101	1476	1541	1277	1184	810	533	297	9595
	82-83	24	6	175	614	874	1197	1130	909	850	735	405	147	7066		82-83	146	80	368	791	1183	1482	1446	1146	1024	939	618	333	9556
	83-84	3	0	124										127		83-84	120	61	334									515	
EAGLE	AVE	33	80	288	626	1026	1407	1448	1148	1014	705	431	171	8377	STERLING	AVE	0	6	157	462	876	1163	1274	966	896	528	235	51	6614
	82-83	54	21	257	720	1059	1350	1273	974	880	846	529	219	8182		82-83	3	3	154	518	933	1098	1046	762	827	674	363	111	6492
	83-84	30	3	203										236		83-84	1	0	98									99	
EVERGREEN	AVE	59	113	327	621	916	1135	1199	1011	1009	730	489	218	7827	TELLURIDE	AVE	163	223	396	676	1026	1293	1339	1151	1141	849	589	318	9164
	82-83	110	41	339	733	1032	1184	940	979	1056	961	694	324	8393		82-83	139	140	364	746	1022	1265	1195	1042	1036	956	620	355	8880
	83-84	72	15	228										300		83-84	108	130	288									526	
FORT COLLINS	AVE	5	11	171	468	846	1073	1181	930	877	558	281	82	6483	TRINIDAD	AVE	0	0	86	359	738	973	1051	846	781	468	207	35	5544
	82-83	4	0	178	509	925	1082	968	787	830	715	389	127	6514		82-83	0	0	66	367	705	949	956	779	730	619	318	66	5555
	83-84	2	0	115										117		83-84	0	0	55									55	
FORT MORGAN	AVE	0	6	140	438	867	1156	1283	969	874	516	224	47	6520	WALDEN	AVE	198	285	501	822	1170	1457	1535	1313	1277	915	642	351	10466
	82-83	3	3	123	492	895	1086	1050	804	798	663	346	108	6371		82-83	201	141	469	878	1242	1441	1396	1173	1122	1052	761	391	10267
	83-84	0	0	77										77		83-84	156	114	387									657	
GRAND JUNCTION	AVE	0	0	65	325	762	1138	1225	882	716	403	148	19	5683	WALSENBURG	AVE	0	8	102	370	720	924	989	820	781	501	240	49	5504
	82-83	2	0	61	397	704	983	946	668	586	482	239	22	5090		82-83	0	1	95	400	714	927	880	719	763	627	314	92	5532
	83-84	0	0	27										27		83-84	0	0	87									87	

Table 2. Colorado Cooling Degree Day Data through September 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	0	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	0	0	0	0	24
ROULDER	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	0	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	0	0	64
BURLINGTON	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	0	0	0	1039
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	0	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	0	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	0	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	0	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	0	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	0	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	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	0	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	0	0	187
EVER-GREEN	AVE	0	0	0	0	0	2	18	14	0	0	0	0	34
	1982	0	0	0	0	0	0	28	25	0	0	0	0	61
	1983	0	0	0	0	0	0	18	25	0	0	0	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	0	0	616
FORT MORGAN	AVE	0	0	0	0	16	155	304	223	62	0	0	0	760
	1982	0	0	0	0	4	17	78	325	319	82	0	0	825
	1983	0	0	0	0	17	97	341	424	144	0	0	0	1023
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	0	0	0	1351

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	0	156	0	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	0	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	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	0	0	0	1525
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	0	0
LIMON	AVE	0	0	0	0	8	97	206	158	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	0	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	0	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	0	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	0	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	0	0	0	0	2
PUEBLO	AVE	0	0	0	0	39	212	369	295	119	8	0	0	1042
	1982	0	0	0	3	30	123	395	368	110	0	0	0	1029
	1983	0	0	0	0	16	120	391	391	149	0	0	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	0	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	0	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	0	0	0	896
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	0	0	3
TRINIDAD	AVE	0	0	0	0	18	155	279	216	68	5	0	0	741
	1982	0	0	0	3	12	83	306	257	95	0	0	0	756
	1983	0	0	0	0	1	100	327	319	167	0	0	0	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	0	0	3
WALSEN-BURG	AVE	0	0	0	0	8	109	219	157	45	0	0	0	538
	1982	0	0	0	1	1	30	250	211	65	0	0	0	558
	1983	0	0	0	0	2	67	266	250	108	0	0	0	693