

WEEKLY WEATHER AND CROP BULLETIN

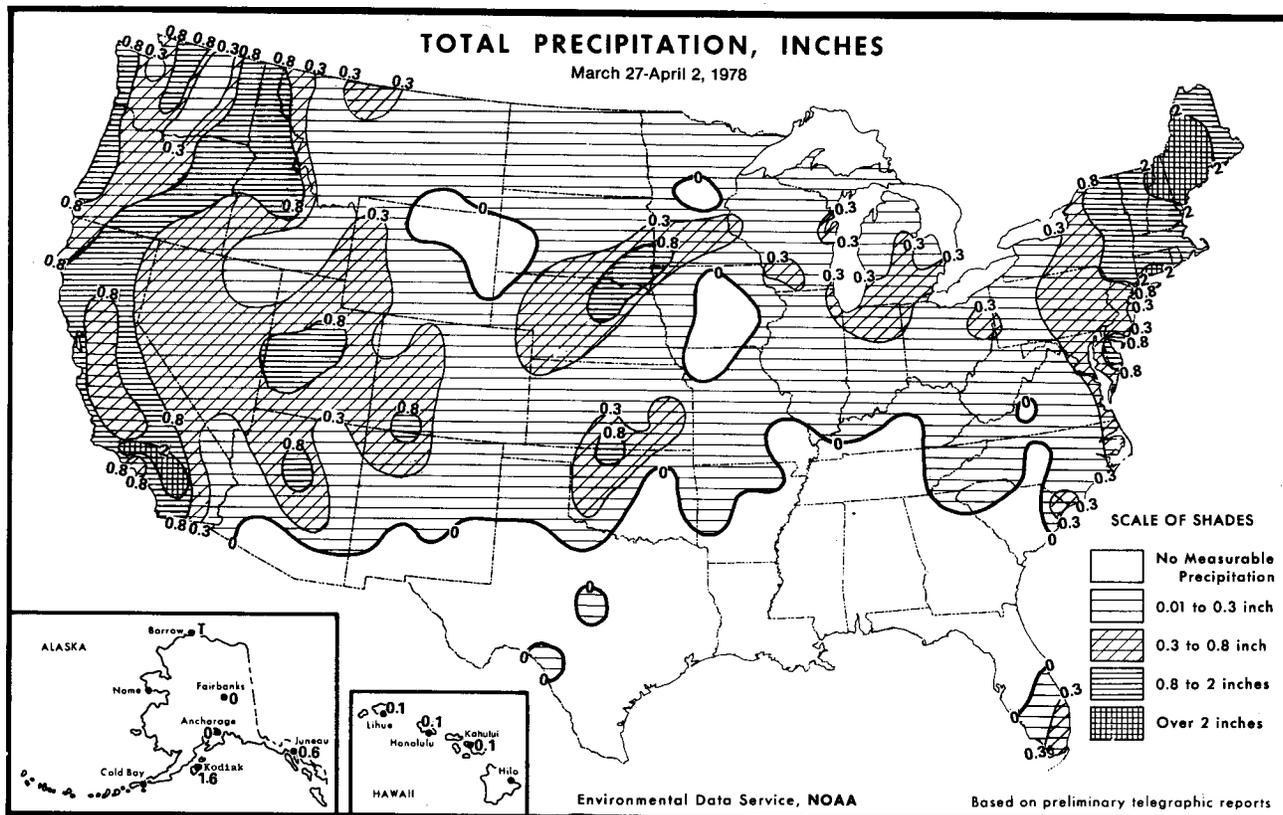
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National Weather Summary

March 27 - April 2

HIGHLIGHTS: Precipitation was generally light over much of the Nation. The southern tier, from Arizona across the Deep South to Florida, was especially dry.

Nearly the entire country registered above-normal temperatures. Only the Gulf Coast and a section around the Great Lakes dipped below the norm.

Rain spread from the middle Atlantic States to New England on Monday; some of the heaviest totals included 1.20 in. at Bridgeport, Conn.; Providence's 1.17 in.; and in Delaware, Wilmington was soaked by 3.11 in., a 24-hour rainfall record that toppled the old mark of 2.75 in. Three-day rainfall meas-

urements in Virginia saw 6.06 in. at Williamsburg and 5.01 in. at Yorktown.

The Rocky Mountain area warmed to rising temperatures; new record highs showed 70° at Missoula, Mont., and 76° at Winnemucca, Nev. In Idaho, record-equaling readings were reported at Boise, 71°, and 69° at Pocatello.

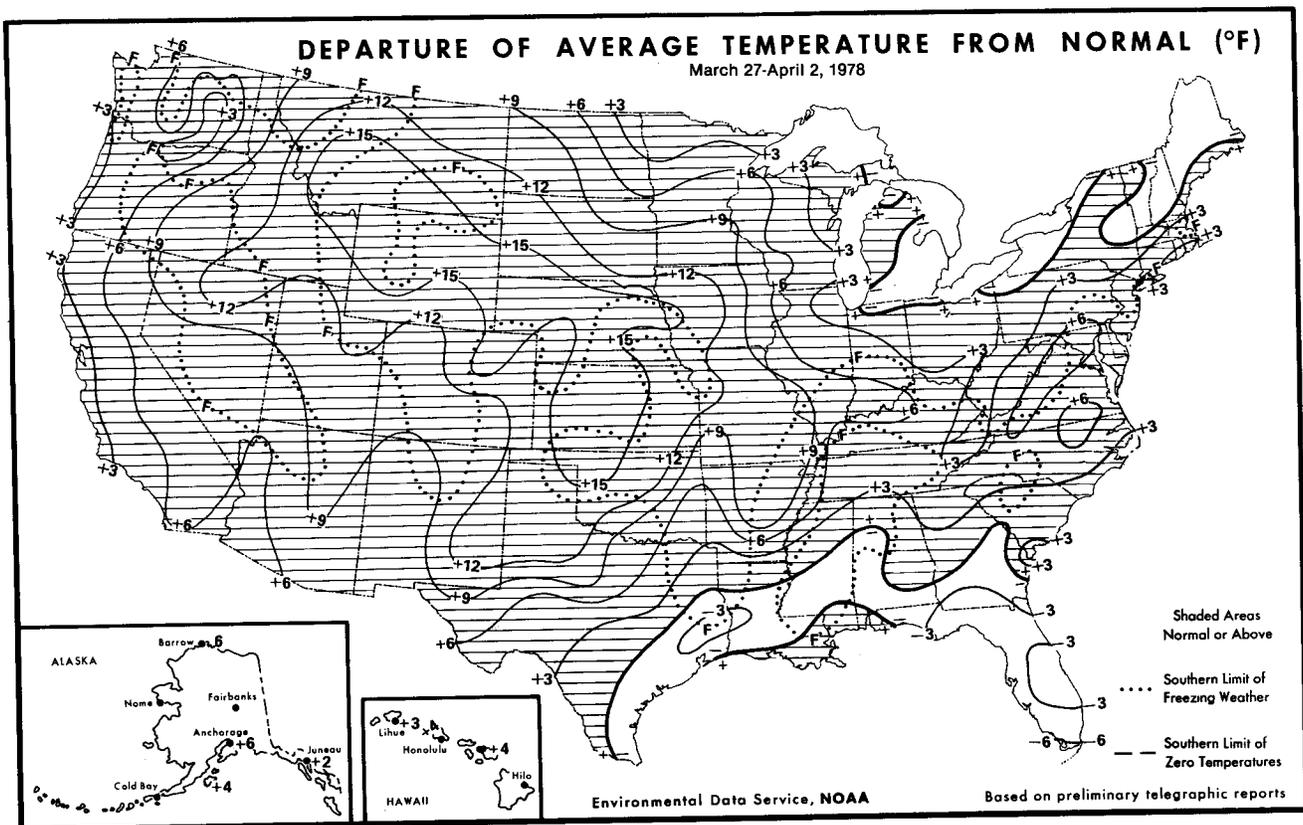
Precipitation was widely scattered on Tuesday; a few showers dampened the upper Atlantic Coast, Florida, and the Pacific Northwest. Block Island, R.I., and Miami both got about a half-inch.

The northern Plains battled flooding as the Red River overflowed in North Dakota and Minnesota.

In contrast to yesterday, temperatures dipped in the South. Tallahassee notched a record low 32°. Record-tying low readings chilled Columbus, Ga., 33°, Jackson, Miss., 31°, and Key West, Fla., 60°. Topeka, at 81°, had its warmest day since October.

Precipitation was lightly scattered over the Nation on Wednesday; the heaviest amount was a quarter-inch of rain in Medford, Ore.

Wednesday marked a rare afternoon when Boise, Idaho's temperature topped the reading in Key West,



Fla., by nearly 10 degrees. In all, 15 western cities measured record high temperatures; Montana noted 11 of them, Idaho had 3, Wyoming 1. Meantime Key West plunged to its lowest afternoon reading ever for this date, 71°.

Southwesterly winds wafted over the country's midsection on Thursday bringing dry weather and unseasonable warmth. New daily high temperatures included 78° at Williston, N. Dak., 79° at Rapid City, S. Dak., and 83° at Scottsbluff, Nebr. Florida got into the act when Apalachicola warmed up to 82°.

But there were drawbacks. Melting snow swelled some waterways. The northern Red River Valley of North Dakota and Minnesota suffered flooding that covered 20 to 25 square miles. An avalanche hazard mounted in the Colorado Rockies. Southwestern Colorado had several slides including one that blocked a highway with 16 feet of snow.

By midnight, low pressure edged into the West Coast; some California stations reported about three-quarters inch of rain.

Atlantic City, N.J., set a record low temperature of 28°.

Rain became heavy over California on Friday; 1 to 2 inches soaked some points. Rain dotted several areas including the Great Lakes, upper Mississippi Valley, and the southern sections of the Plains and Plateau Region; Buffalo got a half-inch while a quarter-inch dampened Fallon, Nev., and Lansing, Mich. Large hail pelted Sierra Blanca in extreme southwestern Texas.

Showers added to the flooding problem in the upper portions of the Midwest and Plains.

A very warm air mass from Colorado to Indiana to Alabama produced more than two dozen record high temperatures. A 90° reading gave Grand Island, Nebr., its hottest March temperature ever. Madison, Wisc., at 81°, chalked up its highest temperature this early in the season.

Saturday's rain fell over the upper Ohio Valley, New York State, and southern New England. Up to 3 inches of snow blanketed northern New England. Thunderstorms clipped the Plains and extended to the Mississippi Valley. Large hail pummeled Hobart and Altus in southwestern Oklahoma while a tornado touched down near Carnegie, Okla. Isolated showers dotted the Virginia/North Carolina border and Tennessee.

Temperatures in the 80's set records along the Atlantic Coast from South Carolina to New Jersey; Washington, D.C., 88°, and Baltimore, 86°, broke 70-year old high marks.

Snow and freezing rain brought winter back to the northern parts of the Plains and Midwest; up to 3 inches of snow whitened towns in the Dakotas and Minnesota. The additional precipitation aggravated the Red River overflow which was 17 feet above flood stage and rising. Thunderstorms rumbled over an area from Oklahoma through the middle Mississippi Valley. Another disturbance over the Plateau Region dumped 2 inches of snow on Ely, Nev.

A stationary front hovering above central Illinois marked the demarcation of warm and cold air. Southern Illinois basked in the 70's; the northern portion of the state shivered in the 30's.

Midland, Tex., tied its record high temperature for the day, 89°, while Wilmington, N.C., at 91°, set a new high.



National Agricultural Summary

March 27 - April 2

HIGHLIGHTS: The mercury shot high above normal throughout most of the Nation, particularly the Great Plains and western Corn Belt. Very little precipitation fell except in southern California and New England. This weather gave farmers a chance to do some fieldwork except where wet soils prevented entry of heavy tillage equipment. This included most of the north central States and the Northeast. Ohio's plowing progress stood at 50%, the same as 1977 and slightly behind the 53% average. Indiana's land preparation, at 40%, equaled average but behind the 50% in 1977. In the south central States, plowing generally lagged 1977 but equaled or exceeded the average. Soil moisture was adequate to surplus except short in parts of Florida, Kansas, Texas, and New Mexico. Small grains rated fair to good and were growing rapidly with the influence of high temperatures. Spring small grain seeding lagged last year and the average. Corn planting was confined below the Mason-Dixon Line; soils need to dry and become warmer. Cotton planting centered in Texas, Arizona, and California. Fruit trees bloomed throughout the South. Vegetable activity moved into northern areas where farmers planted hardy crops. Pasture conditions improved as grasses greened.

SMALL GRAINS: Winter wheat rated fair to good and, in some major production areas, excellent. Higher-than-normal temperatures along with adequate soil moisture in most areas encouraged rapid growth. The crop greened in northern areas. Southern producers sprayed to control insects and weeds. A few early fields headed.

Kansas wheat condition rated good to excellent; top growth generally provided a solid ground cover. Producers sprayed weeds. Soil moisture ranged from short in the west to surplus in the east. Oklahoma soil moisture was adequate and wheat rated fair to good; high temperatures promoted vigorous growth. Weeds infested many fields, but insect activity was minimal. Texas dryland fields greened in the Plains, but low soil moisture limited growth. Some fall planted fields just emerged; no grain production was expected from these fields. Irrigated stands rated good to excellent. Producers sprayed greenbugs and grazed a few fields. New Mexico wheat rated poor to excellent depending on the soil moisture supply. Arizona winter wheat heading was well advanced; earlier fields began to change color slightly. California small grain growth was good. Oregon wheat fields rated good; farmers fertilized.

Winter wheat in the south central States rated fair to good. In Mississippi, 26% of the wheat reached the jointing stage, shy of 1977's 39%. Standing water damaged some Virginia wheat. Indiana wheat rated fair reaching 2 in. growth, short of last year's 3 in.

Spring planting of oats and barley lagged recent years; cold, wet soils delayed progress. No oats was seeded in Indiana compared with 20% last year and average. Nebraska oats and barley seeding stood at less than 5%, short of 1977's 25% and the 10% average. Colorado seeding also fell short of 1977 and the average. Kansas oats planting reached 20%, below 1977's 90% and the 60% average. Missouri oats seeding stood at 3%, far short of last year's 81% and the 45% average.

OTHER CROPS: Corn planting advanced in southern States. Virginia planting remained at 1%, North Carolina growers were just starting. Planting

nearly equaled or exceeded recent years in most southern States. South Carolina seeding reached 32%, Georgia 27%, Mississippi 25%, Louisiana 35%, Texas 24%, and Alabama planted early fields. Low soil temperatures and muddy fields prevented faster progress northward.

Cotton planting reached 12% in Texas, ahead of 1977's 4% but far behind the 41% average. Rio Grande Valley and Coastal Bend fields were up to good stands. Rising soil temperatures governed northward progress; planting began in central and northern Texas. High and Low Plains producers prepared land. Arizona growers planted and also cultivated earliest emerged fields in western areas. Some California cotton fields were up. Arkansas growers cut stalks and prepared seedbeds.

Growers planted rice in Louisiana, Texas, and California. Louisiana producers seeded 38%, ahead of 25% last year. Texas rice planting advanced to 35%, compared with 1977's 30% and the 51% average; growers flushed fields to bring up stands. Arkansas producers fertilized and prepared seedbeds.

Texas sorghum planting advanced to 53%, surpassing both 1977's 43% and the 41% average.

Texas peanut growers planted 3% of the acreage, short of the 9% for last year and average. Florida growers also were planting.

Potato growers planted spuds across the South, the Mountain States, and the Pacific Northwest.

FRUITS AND NUTS: Deciduous growers pruned trees in northern areas. Buds swelled in Virginia. Peaches bloomed in South Carolina, Arkansas, Texas, and Georgia; trees were in good condition. Cherries bloomed in Washington and Oregon. Washington pears approached bloom. Utah fruit trees bloomed 3 weeks early. Ohio fruit development lagged normal. California deciduous flowering was almost complete including apples, peaches, pears, nectarines, and almonds. Growers sprayed walnuts to control blight.

Florida's Valencia harvest just started. Citrus groves rated excellent; just past peak bloom. All areas needed rain; some growers irrigated. Texas citrus trees were in full bloom; late harvest continued. Arizona growers harvested Valencias, grapefruit, tangerines, and lemons. Adverse weather caused heavy culling of California Navels; growers also harvested grapefruit, lemons, and Valencias.

VEGETABLES: Vegetable planting spread northward where growers transplanted cold-tolerant crops. Florida vegetables improved with warm sunny weather. Temperatures ranged from the 60's to the 80's; growth, quality, and fruit set were very good. Overall shipments increased 9%. Volume increased or held steady for all crops except chinese cabbage, okra, and tomatoes. Watermelons rated good with older plants running and small fruit evident. Texas producers harvested cabbage, carrots, lettuce, spinach, broccoli, and onions and planted bell peppers, cucumbers, and tomatoes. Arizona growers harvested lettuce, carrots, cauliflower, broccoli, and cabbage. California asparagus harvest declined; lettuce picking increased.

PASTURES AND LIVESTOCK: Grasslands rated excellent in the West Coast States, fair to good across the South, and poor to fair in northern areas. Pastures began greening in most of the Nation, but soggy soils and slow growth kept cattle out of most northern pastures. Florida pastures improved but grew slowly. Texas pastures yielded more grazing, however, livestock producers gave additional feed. California ranges rated excellent.

Temperature and Precipitation Data for the Week Ending Midnight, l.s.t., April 2, 1978

States and Stations	Temperature °F		Precipitation Inches		States and Stations	Temperature °F		Precipitation Inches		States and Stations	Temperature °F		Precipitation Inches	
	Average	Departure	Total	Departure		Average	Departure	Total	Departure		Average	Departure	Total	Departure
ALA, Birmingham . . .	58	0	0	-1.3	LA, Baton Rouge . . .	63	-1	0	-1.2	Youngstown . . .	41	0	-2	-
Mobile . . .	63	0	0	-1.6	Lake Charles . . .	62	-2	0	-0.9	OKLA, Okla. City . . .	66	+12	T	-
Montgomery . . .	61	+1	0	-1.3	New Orleans . . .	65	+1	0	-1.1	Tulsa . . .	66	+12	T	-
ALASKA, Anchorage . . .	34	+6	0	-1.1	Shreveport . . .	62	+1	0	-1.0	OREG, Astoria . . .	48	+3	8	-
Barrow . . .	16	-6	T	-1	MAINE, Caribou . . .	28	-2	1.5	+1.0	Burns . . .	49	+10	1.0	+8
Fairbanks . . .	18	0	0	-1	Portland . . .	38	+1	3.0	+2.2	Medford . . .	51	+4	4	+1
Juneau . . .	37	+2	6	-1	MD, Baltimore . . .	54	+6	5.5	3	Pendleton . . .	50	+3	1.0	+8
Kodiak . . .	38	+4	1.6	+8	MASS, Boston . . .	47	+4	9	0	Portland . . .	51	+4	4	-3
Nome . . .	-	-	-	-	Chatham . . .	42	-	9	-	Salem . . .	50	+3	4	-4
ARIZ, Flagstaff . . .	44	+7	9	+5	MICH, Alpena . . .	34	+2	1	-4	PA, Allentown . . .	49	+5	7	-1
Phoenix . . .	71	+8	1	0	Detroit . . .	39	-2	5	-2	Erie . . .	36	-2	1	-6
Tucson . . .	68	+7	0	-1	Flint . . .	38	-1	2	-4	Harrisburg . . .	51	+5	5	-2
Winslow . . .	58	+10	T	-1	Grand Rapids . . .	40	+1	2	-5	Philadelphia . . .	51	+4	7	-1
Yuma . . .	71	+4	T	0	Houghton Lake . . .	33	0	1	-4	Pittsburgh . . .	46	+2	2	-6
ARK, Fort Smith . . .	61	+5	1	-8	Lansing . . .	38	-1	3	-3	Scranton . . .	44	+2	5	-1
Little Rock . . .	65	+10	0	-1.1	Marquette . . .	35	+2	T	-5	R.I, Providence . . .	45	+3	1.3	+4
CALIF, Bakersfield . . .	64	+5	3	+1	Muskegon . . .	40	+2	2	-5	S.C, Charleston . . .	62	+2	T	-9
Eureka . . .	52	+3	5	-4	S. Ste. Marie . . .	29	-1	3	-1	Columbia . . .	60	+1	0	-1.0
Fresno . . .	62	+6	1.3	+9	MINN, Duluth . . .	37	+6	2	-3	Greenville . . .	58	+3	T	-1.2
Los Angeles . . .	64	+4	7	+3	Internatl Falls . . .	30	+1	3	0	S.D, Aberdeen . . .	42	+7	2	-1
Red Bluff . . .	61	+6	1.1	+7	Minneapolis . . .	45	+9	4	0	Huron . . .	47	+10	T	-3
San Diego . . .	65	+6	1.1	+8	Rochester . . .	45	+9	2	-3	Rapid City . . .	52	+15	T	-3
San Francisco . . .	55	+1	9	+4	St. Cloud . . .	42	+8	0	-4	Sioux Falls . . .	48	+11	1.0	+6
Stockton . . .	60	+5	6	+2	MISS, Jackson . . .	60	0	0	-1.2	TENN, Chattanooga . . .	59	+4	0	-1.2
COLO, Denver . . .	56	+15	2	-2	Meridian . . .	58	-2	0	-1.4	Knoxville . . .	58	+3	T	-1.0
Grand Junction . . .	56	+10	3	+1	MO, Columbia . . .	58	+10	2	-5	Memphis . . .	65	+9	0	-1.2
Pueblo . . .	56	+11	T	-2	Kansas City . . .	60	+13	T	-7	Nashville . . .	58	+4	0	-1.1
CONN, Bridgeport . . .	46	+3	2.0	+1.2	St. Louis . . .	59	+10	1	-7	TEX, Abilene . . .	69	+10	T	-3
Hartford . . .	46	+5	1.4	+5	Springfield . . .	58	+9	T	-8	Amarillo . . .	63	+13	T	-2
D.C, Washington . . .	56	+6	4	-3	MONT, Billings . . .	53	+16	2	-1	Austin . . .	65	+1	T	-5
FLA, Apalachicola . . .	59	-5	0	-1.0	Glasgow . . .	43	+10	1	0	Beaumont . . .	64	0	0	-7
Daytona Beach . . .	63	-4	T	-7	Great Falls . . .	50	+15	3	0	Brownsville . . .	70	-1	0	-2
Ft. Myers . . .	67	-4	T	-6	Havre . . .	46	+12	3	+1	Corpus Christi . . .	67	-2	0	-3
Jacksonville . . .	61	-3	0	-8	Helena . . .	52	+17	2	0	Dallas . . .	-	-	-	-
Key West . . .	69	-7	3	-1	Kalspell . . .	45	+10	3	+1	Del Rio . . .	71	+4	3	+1
Lakeland . . .	66	-3	0	-8	Miles City . . .	50	+13	1	-1	El Paso . . .	67	+8	0	-1
Miami . . .	68	-5	5	-1	Missoula . . .	51	+13	1	-1	Fort Worth . . .	65	+6	T	-8
Orlando . . .	68	0	0	-1.8	NEBR, Grand Island . . .	57	+15	2	-2	Galveston . . .	64	-1	0	-6
Tallahassee . . .	59	-5	0	-1.2	Lincoln . . .	56	+13	-1	-4	Houston . . .	62	-3	0	-6
Tampa . . .	65	-4	0	-0.8	Norfolk . . .	56	+16	2	-2	Lubbock . . .	66	+12	T	-2
W. Palm Beach . . .	69	-3	6	-2	N. Platte . . .	54	+14	4	+1	Midland . . .	71	+6	0	-1
GA, Atlanta . . .	60	+5	0	-1.3	Omaha . . .	56	+15	T	-5	San Angelo . . .	67	+5	T	-3
Augusta . . .	59	0	0	-1.0	Valentine . . .	52	+15	4	+1	San Antonio . . .	66	+1	0	-4
Macon . . .	62	+1	0	-1.0	NEV, Ely . . .	43	+7	6	+4	San Antonio . . .	65	-1	0	-4
Savannah . . .	66	+4	0	-9	Las Vegas . . .	65	+7	2	+1	Victoria . . .	66	+4	T	-7
HAWAII, Hilo . . .	-	-	-	-	Reno . . .	50	+7	4	+3	Waco . . .	67	+9	T	-4
Honolulu . . .	77	+4	1	-5	Winnemucca . . .	52	+12	3	+2	Wichita Falls . . .	67	+9	1	-4
Kahului . . .	77	+4	1	-4	N.H, Concord . . .	37	-1	1.3	+7	UTAH, Blanding . . .	52	+10	6	+4
Lihue . . .	75	+3	1	-9	N.J, Atlantic City . . .	51	+5	1	-8	Salt Lake City . . .	55	+11	7	+2
IDAHO, Boise . . .	55	+11	6	+9	Trenton . . .	51	+5	3	-5	VT, Burlington . . .	37	+1	1.9	+1.4
Lewiston . . .	54	+8	1.1	+9	N.MEX, Albuquerque . . .	57	+7	1	0	VA, Lynchburg . . .	56	+5	T	-7
Pocatello . . .	51	+12	1	-1	Roswell . . .	66	+12	T	-1	Norfolk . . .	57	+5	5	-2
ILL, Cairo . . .	59	+6	T	-1.1	N.Y, Albany . . .	39	-1	1.5	+9	Richmond . . .	56	+4	1	-6
Chicago . . .	45	+2	4	-7	Binghamton . . .	37	0	5	-2	Roanoke . . .	57	+7	T	-7
Moline . . .	48	+5	1	-7	Buffalo . . .	37	-1	1	-6	WASH, Colville . . .	49	+6	T	-2
Peoria . . .	48	+4	1	-8	New York . . .	50	+4	7	-2	Omak . . .	47	+4	1.3	-9
Rockford . . .	44	+3	2	-6	Rochester . . .	38	-1	2	-4	Quillayute . . .	50	+4	1.3	-4
Springfield . . .	52	+6	1	-7	Syracuse . . .	39	0	6	-1	Seattle-Tacoma . . .	47	+6	1.0	+7
IND, Evansville . . .	56	+6	1	-9	N.C, Asheville . . .	54	+4	T	-1.0	Spokane . . .	55	+6	8	-5
Ft. Wayne . . .	44	+2	5	-3	Charlotte . . .	59	+4	T	-9	Walla Walla . . .	51	+7	1	-0
Indianapolis . . .	50	+4	1	-8	Greensboro . . .	57	+4	T	-8	Yakima . . .	50	+4	1	-8
South Bend . . .	40	-1	4	-4	Hatteras . . .	57	+3	5	-3	W.Va, Beckley . . .	53	+3	1	-8
IOWA, Burlington . . .	50	+7	T	-8	Raleigh . . .	60	+6	T	-8	Charleston . . .	53	+3	2	-7
Des Moines . . .	54	+13	T	-6	Wilmington . . .	61	+3	1	-7	Huntington . . .	51	+3	T	-8
Dubuque . . .	45	+6	2	-7	N.DAK, Bismarck . . .	43	+10	2	0	Parkersburg . . .	38	+2	3	-2
Sioux City . . .	53	+13	2	-2	Fargo . . .	36	+3	1	-2	WIS, Green Bay . . .	45	+6	1	-5
KANS, Concordia . . .	61	+16	T	-4	Williston . . .	43	+11	1	-1	La Crosse . . .	43	+6	2	-4
Dodge City . . .	64	+17	T	-3	OHIO, Akron-Canton . . .	42	0	3	-5	Madison . . .	42	+4	3	-3
Goodland . . .	55	+14	3	0	Cincinnati . . .	50	+3	T	-9	Milwaukee . . .	51	+15	1	-2
Topeka . . .	61	+14	T	-7	Cleveland . . .	43	+1	2	-6	WTO, Casper . . .	49	+13	T	-3
Wichita . . .	64	+15	2	-3	Columbus . . .	46	+1	1	-7	Cheyenne . . .	49	+13	T	-3
KY, Lexington . . .	54	+5	T	-1.0	Dayton . . .	47	+2	1	-7	Lander . . .	52	+16	T	-4
Louisville . . .	56	+7	T	-1.1	Toledo . . .	41	-1	1	-5	Sheridan . . .	53	+17	T	-4
										P.R, San Juan . . .	80	+3	2.0	+1.5

Based on 1941-70 normals

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State Summaries of Weather and Agriculture

These summaries provide brief descriptions of crop and weather conditions important on a national scale. More detailed data are available in Weather and Crop Bulletins published each Monday by ESCS State offices in cooperation with the National Weather Service.

ALABAMA: Temperatures warmed to summer levels, but averaged 1° above normal. Dry conditions continued, no rain recorded.

Fieldwork: 5.8 days suitable. Land preparation continued at rapid pace. Some early corn planted. Small grains fair condition. Pastures improved; some hay still being fed.

ARIZONA: Scattered showers, cooler near weekend. Precipitation mostly 0.10 to 0.50 in. Temperatures 2 to 10° above normal early week, dropping 10 to 15° toward weekend.

Cotton planting active, first cultivation under way western areas. Preparation, planting grain sorghum and corn continued. Small grains good progress, heading well advanced, earlier plantings slight color change. Safflower growing well. Sugarbeets mostly good condition, some tops deteriorating. First cutting alfalfa hay nearing completion. Second cutting well advanced. Planting, thinning, weeding vegetables. Harvests lettuce, carrots, cauliflower, broccoli, cabbage continue. Cantaloup planting still underway; stands satisfactory. Valencia harvest gaining momentum. Grapefruit, tangerine harvest continued. Most of lemon crop going to products. Citrus groves full bloom. Ranges making excellent progress. Water abundant in stock tanks. Soil moisture adequate. Livestock good condition, little supplemental feeding.

ARKANSAS: Weather cold to warm. Extremes: 25 and 89°. Mean temperatures 60 to 65°; normals ranged from 53 to 60°. Spotty showers, heaviest amount 0.07 in.

Land preparation active early to midweek. Fieldwork: 5 days suitable. Soil moisture adequate to surplus. Limited planting. Nitrogen application active. Soybeans: disking, applying fertilizer. Rice: applying fertilizer, and seedbed preparation. Cotton stalk cutting and seedbed preparation. Corn and sorghum fieldwork active. Wheat and oats fair to good condition. Strawberries good condition. Tomatoes limited planting. Pastures later than normal. Livestock below normal condition. Supplemental hay and feed being fed.

CALIFORNIA: Precipitation general; San Joaquin Valley and south coast received most. Snow over Sierra mostly wet. Average temperatures again several degrees above normal. Desert areas reached to mid-90's and south coast upper 80's. Central Valley had highs into upper 70's. Coldest temperatures extreme north and high Sierra with lows in 20's and upper teens.

Small grain growth good. Some barley heading. Aphids problem in barley and alfalfa. Alfalfa mostly ready first cutting. Weevils treated. Safflower and rice plantings progressing. Cotton up. Sugarbeets nearing maturity. California fruits given normal care. Preventive care for diseases and insects applied. Apples, peaches, pears, nectarines, and prune flowerings nearly complete. Grape vineyards continued to grow and develop. Avocado harvesting slowed. Continued heavy culling Navel oranges; weather the major cause. Grapefruit, lemons, and Valencias harvested. Almond blossoming almost over. Spraying walnuts for blight. Asparagus harvest decreasing south. Lettuce harvest increasing San Joaquin Valley, started Salinas-Watsonville. Strawberry movement heavy south coast, picking started Salinas-

Watsonville. Excellent development on ranges and pastures. Moisture supplies adequate. Cattle bloat reported in heavy clover.

COLORADO: Very warm dry weather. Light precipitation 31st averaged 0.20 in. Temperatures averaged 11 to 13° above norm eastern Plains; 7° above norm San Luis Valley; 10° above norm western slope.

Winter wheat fair, 2% pastured, root rot a major concern. Oats seeded 21%, 32% 1977, 30% average. Spring barley seeded 13%, 24% 1977, 23% average. Summer potatoes planted 11%, 14% 1977, 7% average. Ranges and pastures fair to poor. Alfalfa fair to good. Calving and lambing past midway point. Deaths below average.

FLORIDA: Rainfall sparse except over southeast; amounts 0.50 to 1.25 in. Temperatures near to a few degrees below normal.

Soil moisture adequate west, north, mostly short central, south. Planting corn, tobacco, peanuts active. Land being prepared for soybeans. Small grains good condition, some heading central areas. Sugarcane harvest complete; young cane good condition. Peach prospects good. Pastures improving; however growth short. Soil moisture low some areas. Some irrigation underway. Fertilization active. Cattle condition mostly poor to good. Citrus tree condition excellent, peak bloom past week. All areas need rain, some growers irrigating. Early orange harvest complete. Valencia harvest just starting. Weather warm, sunny in vegetable growing areas. Weak cold front lowered temperatures slightly. Cloudy skies, light, scattered showers preceded front. Winds light to moderate. Daytime temperatures in 70's and 80's; night lows in 60's. Vegetables fair to very good and improving. Growth, quality, fruit set very good. Fruit sizing well. Overall shipments up 9% from previous week. Volume increased for cucumbers, eggplant, strawberries, lettuce, peppers, potatoes, radishes, squash. Shipments snap beans, cabbage, carrots, celery, sweet corn, escarole held steady. Supplies chinese cabbage, okra, tomatoes decreased. Watermelon crop condition mostly good. Growth, progress excellent. Older plantings running. Small fruit evident. First harvest expected first of May.

GEORGIA: Temperatures near normal north, 1 to 2° below normal south. Averages 49° extreme northeast to 62° extreme southeast. Showers and thundershowers first part of week; amounts generally less than 0.25 in. Dry 1st and 2d.

Soil moisture short to mostly adequate. Fieldwork: 5 days suitable. Planting and land preparation active. Corn 27% seeded, 36% last year, 18% average. Tobacco improved, now fair to good; 12% transplanted, 26% last year and 36% average. Small grains improved; fair to mostly good. Pastures improved; fair to good. Fertilizer application active. Watermelons 42% planted, 38% last year. Peaches fair to mostly good; full bloom. Apples fair to mostly good; spraying active. Cattle fair to good. Hogs good.

HAWAII: Favorable weather continues. Rains beneficial to crops. Wahiawa reservoirs central Oahu still dry. More rains needed to replenish.

Spraying frequent for insect and disease control. Vegetable supplies: semi-head lettuce oversupply; economic abandonment Waianae, Oahu.

All cabbage crops, ginger, romaine heavy. Others light to moderate. Bananas light. Papayas light to moderate. Most sugar mills operating. Pine-apple harvesting light. Pastures improving.

IDAHO: Temperatures 3 to 13° above normal. Highs 60's and 70's in north and 70's and 80's in south. Precipitation limited to north.

Farmers very active preparing seedbeds and planting in southwest and south central. Fieldwork and seeding just starting other areas. About 16% spring wheat and barley planted and 20% of sugarbeets. Soil moisture adequate. Winter wheat condition good to excellent. Some livestock on lower ranges. Calf and lamb losses light.

ILLINOIS: Temperatures 2 to 10° above normal. Precipitation ranged from 0.10 in. north to 3.00 in. southwest.

Winter wheat, legumes mostly good. Livestock good condition; some pig and calf losses reported; feedlots muddy. Thawing roads hindering grain and livestock marketing. Fieldwork minimal. Most fields too muddy. Soil moisture adequate to surplus.

INDIANA: Sunny, warm. Solar radiation 65% of possible. Temperatures averaged a few degrees above normal and ranged from 26 to 83°. Precipitation over weekend ranged from 0.50 in. north to none in south.

Soils wet and cool. No fieldwork. Topsoil and subsoil moisture surplus. Corn and soybean land 40% plowed, 1977 50%, average 40%. No oats seeded, 1977 20%, average 20%. Clover 10% seeded, 1977 60%. Wheat fair condition; 2 in. high, 1977 3 in. Apple buds 75% alive. Peach buds 55% alive. Pastures poor to fair.

IOWA: Warm, dry. Temperatures about 6° above normal east and 12 to 14° above normal southwest. Temperatures rose into 80's on 30th and 31st reaching 89°. Scattered showers on weekend.

KANSAS: Rainfall limited to scattered showers and thunderstorms 1st and 2d. Accumulations less than 0.25 in. Temperatures ranged 58° northwest; 61 to 64° elsewhere, or 10 to 15° above normal.

Wheat condition rated good to excellent, generally supplying solid ground cover. Some spraying for weeds. Evidence of soil-borne mosaic south central. Soil moisture short northwest, west central, short to adequate southwest, mostly adequate central, adequate to surplus east. Oats 20% seeded, 60% normal, 90% last year. Spring barley 25% seeded, 50% normal, 95% last year.

KENTUCKY: Temperatures 5 to 10° above normal; rainfall sparse. Temperature in mid-50's and rainfall less than 0.25 in.

Fieldwork: 3 days suitable. Soil moisture adequate to surplus. Land plowed 30%, 56% last year. Tobacco beds 26% seeded; less than 1% with plants up. Pastures late, condition fair. Wet fields limited grazing. Hay supply short after record cold winter. Calf and pig loss unusually high.

LOUISIANA: Temperatures normal north, 1 to 2° below elsewhere. Extremes: 30 and 87°. No rain.

Activities: fertilizing pastures, land preparation, herbicide application, corn and rice planting. Fieldwork: 5.4 days suitable. Soil moisture adequate. Rice 38% planted, 25% year ago. Corn 35% planted, 37% last year. Sugarcane emerging. Vegetable planting, sweetpotato bedding active. Tomatoes transplanted, staked. Strawberries developing rapidly. Small grains fair to good condition. Pasture poor to fair. Cattle fair.

MARYLAND & DELAWARE: Temperatures about normal. Highs averaged upper 50's to 60° and lows in 40's. Western Maryland slightly colder. Precipitation moderate, 2.00 to 4.00 in. rain. Weekend fair and mild with light showers 2d.

Most areas too wet to begin spring fieldwork.

MICHIGAN: Temperatures 1 to 2° below normal south-east Lower to normal or slightly above normal over northern Lower and Upper. Unseasonably warm temperatures across much of southern Lower 31st with temperatures in 70's. Precipitation light and mostly restricted to weekend averaging about 0.16 in.

Pruning fruit trees, feeding of livestock main activities. Field conditions too wet to permit fieldwork.

MINNESOTA: Temperatures near normal northeast to 10° above normal southwest. Extremes: 81 and 10°. Precipitation 0.20 to 0.40 in. below normal except near normal north central and east central and normal to 0.45 in. above normal extreme southwest. Precipitation totals less than 0.25 in. except 0.25 to 0.35 in. north central and 0.25 to 0.85 in. southwest through east central. Snowfall averaged from a trace southwest to about 3 in. northeast late on weekend. Snow depths from 0 south to 9 in. north central.

MISSISSIPPI: Temperatures 5 to 10° subnormal. Extremes: 25 and 88°.

Soil moisture adequate. Fieldwork: 5.7 days suitable. Acreage plowed 48%, 59% 1977, 40% average. Irish potatoes 72% planted, 71% 1977; corn 25% planted, 20% 1977. Winter wheat 26% jointing, 39% 1977. Oats 23% jointing, 41% 1977. Pastures in fair to good condition.

MISSOURI: Temperatures normal in Bootheel, 3 to 7° above normal elsewhere. Precipitation negligible.

Fieldwork: 1 day suitable. Oats sown 3% this year, last year 81%, normal 45%. Condition of winter wheat mostly fair. Condition of pasture mostly fair. Supply of hay and other roughages mostly adequate. Soil moisture supply mostly surplus.

MONTANA: Mild and dry through midweek. Significant cooling by weekend with areas of scattered rain or snow. Temperatures 10 to 16° above normal. Precipitation heaviest north central and central, elsewhere light and spotty.

Soil moisture adequate. Winter wheat condition good, greening most areas except north central and northeast. Winter kill light. Fieldwork starting west and south central. Calving and lambing 50% complete, losses above normal for calves. Shearing 50% complete. Roughage supplies short east, adequate other areas. 90% livestock on supplemental feed.

NEBRASKA: Temperatures 13 to 17° above normal. Precipitation sparse occurring as showers 2d.

Winter wheat rated good or better. Very little barley or oats seeded, year ago this date 25% planted, normal 10%. Topsoil and subsoil moisture adequate or better. Range and pasture condition mostly adequate. Fieldwork: 7 days suitable. Soil wet most localities.

NEVADA: Record high temperatures early, cooling end of week. First outbreak of spring thunderstorms early. Precipitation amounts varied considerably. Temperatures averaged 7 to 14° above seasonal normals. Extremes: 85 and 21°.

Good progress seedbed preparation. Ranges and crops continue to green. Irrigation prospects better than last year.

NEW ENGLAND: Temperatures 5 to 10° above normal 27th to 29th then cooled to near normal 30th and 31st. Precipitation 0.75 to 2.00 in. 27th as rain south and rain or snow changing to rain north. Up to 0.25 in. rain south 1st and from 0.25 to 0.75 in. mostly as rain north.

NEW JERSEY: Temperatures normal north and 2° above normal elsewhere. Extremes: 21 and 84°. Rainfall light, averaging 0.27 in. north, 0.10 in. central and 0.04 in. south. Four inch soil temperature averaged 36° north, 40° central and 48° south.

Field activity increasing as soil dries. Soil preparation underway for spring planted crops. Warm temperatures on 1st greened pastures. Crop progress continues several weeks behind schedule.

NEW MEXICO: Scattered light showers mid and last half of week north. Rainfall less than 0.50 in. and mostly less than 0.10 in. Very warm temperatures.

Moisture short to adequate. Winter wheat varies widely from poor to excellent. Except for northern most areas, alfalfa broke dormancy. Lettuce, onions, progressing well. Ranges in fair condition.

NEW YORK: Temperatures near or a few degrees below normal. Precipitation falling as rain in south, and rain or snow in north, averaged between 1.00 and 2.00 in. water content.

NORTH CAROLINA: Week began wet, but ended dry. Fieldwork: 3.5 days suitable. Soil moisture mostly adequate. Condition of small grains fair to good; pastures fair; tobacco beds and Irish potatoes mostly fair to good. Supplies hay and roughage short to adequate; feed grains short to mostly adequate. Plantings Irish potatoes about 80% complete; corn just underway.

NORTH DAKOTA: Temperatures 6 to 16° above normal. Extremes: 15 and 78°. Precipitation very light; trace or less. River levels reached flood stages late in month with considerable farmland now flooded in Red River Valley.

Mild temperatures providing excellent conditions for calving and lambing. Some areas in northwest could be ready for fieldwork within 2 weeks.

OHIO: Cool wet weather early gradually changed to warm and sunny by weekend. Temperatures slightly above normal, with lows in mid-20's to highs in 70's. Rainfall mostly above normal plus cloudiness kept drying rates slow except at end of week.

Land plowed 50%, 50% 1977, 58% average. Oats planted less than 1%, 15% 1977, 10% average. Fieldwork: less than 1 day favorable. Pasture condition fair. Soil moisture surplus. Main activities: hauling manure, orchard pruning. Cabbage plants set in southeast. Fruit tree development behind last year's progress. Fertilizing wheat.

OKLAHOMA: Temperatures 9 to 13° above normal except 6° above normal southeast. High temperatures into 90's extreme west. Rain light and spotty.

Topsoil and subsoil moisture supplies adequate. Wheat rated good to fair, vigorous growth due to above normal temperature and adequate moisture. Insect activity minimal but weed population high. Native pastures just beginning to green. Live-stock good condition.

OREGON: Rainfall generally less than normal; interior valleys of west received 0.25 in. or less. Along coast Astoria reported 1.86 in., remainder of coast received 0.40 in. or less. Over east amounts less than 0.10 in. Temperatures averaged 6 to 12° above seasonal normal. Extremes: low 70's, low 30's west; high 70's, upper 20's east.

Soil moisture supply adequate. Spring land preparation continues; spring planting underway. Fertilization continues on fall grain and grass fields. Cereal grains good as are seed fields. Many crops ahead of schedule. Fruit activity picking up; cherries blooming. Feeding continues; supplies adequate. Cattle making excellent gains.

PENNSYLVANIA: Generally sunny to partly cloudy, seasonable temperatures through 31st. Windy with record breaking warmth southeast 1st. Cool and breezy 2d with light rain developing. Extremes: 85 and 11°. Dry with less than 0.25 in. rainfall. Farmers still preparing to enter fields. Most soils too wet.

PUERTO RICO: Island average rainfall 0.96 in. or 0.39 in. above normal. Temperatures averaged 77° on coasts and 72° interior. Extremes: 94 and 54°.

SOUTH CAROLINA: Temperatures near normal. Rainfall light; 0.10 to 0.30 in. north, east plus scattered showers elsewhere.

Fieldwork: 5 days suitable. Tobacco plants fair, cold slowed growth. Only 2% transplanted, 5% last year. Corn planting underway where soil moisture and warmth permit; 32% planted, 27% last year, 29% average. Peach condition good; some early varieties approaching full bloom. Some earlier frost damage Piedmont where bloom 2 to 3 weeks later than last year. Small grain condition good; improved with warmer weather. Pastures fair, improving. Applying lime, fertilizer, herbicides, pesticides, preparing land for spring crops. Setting tomatoes, planting other vegetables; some up to poor stands.

SOUTH DAKOTA: Temperatures 3 to 12° above normal east, 7 to 17° above normal central and west. Extremes: 23 and 89°. Precipitation 1st and 2d heaviest east. Amounts central and northeast 0.20 in. or less. Amounts southeast 0.50 to 1.21 in.

Fieldwork only just beginning in few instances where conditions permit. Last year 5% of spring plowing completed.

TENNESSEE: Dry weather. Few light scattered showers. Temperatures near normal east, 3 to 9° above normal middle and west. Rainfall 0.25 in. extreme east, 0.10 in. or less middle and west.

Fieldwork: 3.3 days suitable. Soil moisture adequate. Pastures fair. Cattle still on feed. Wheat and oats fair. Spring plowing 33% complete, 1977 65%, normal 53%. Tobacco beds seeding 59% complete, 1977 90%, normal 87%. Main activities: fertilizing pastures and wheat, spring plowing, feeding cattle, and tobacco bed preparation.

TEXAS: Fair weather; rainfall nil, light amounts over west. Temperatures mid to upper 60's over north, northwest and lower Gulf Coast; low 70's elsewhere. Soil temperatures south and west central mostly 70's and low 80's; over mesa and southern High Plains 83°; over east upper 60's.

Soil moisture short. Continued warm weather promoted good growth of small grains, provided excellent conditions for planting and fieldwork. Cotton stands good early planted fields Coastal

Bend, lower Rio Grande Valley. Planting beginning central, north as soil temps rise. Producers High, Low Plains busy preparing land. In Trans-Pecos planting of pima cotton just getting underway. 12% of cotton crop planted, 4% 1977, 41% average. Corn planting underway except Panhandle; stands good in early planted fields. Growth slow due to cool evenings. Producers in Coastal Bend waiting for increased moisture to finish planting. Dryland wheat fields greened up in Plains area showing limited growth due to critical moisture situation. Few fall planted fields just beginning to emerge and are not expected to produce a grain crop. Irrigated fields good to excellent condition. Producers spraying for greenbugs. Wheat fields providing limited grazing. Oat fields showing good growth with continued warm weather, and providing good grazing. Moisture needed for continued development. Peanut planting continues south; 3% planted, 9% 1977, 9% average. Rice planting 35% complete, 30% 1977, 51% average. Producers flush fields to bring up stands. Sugarcane harvest in final stages, with completion expected in a week. Sorghum planted 53%, 43% 1977, 41% average. Corn planted 24%, 22% 1977, 33% average. Sugarbeets planted 23%, 12% 1977, 28% average.

Harvests cabbage, carrots, lettuce, spinach, broccoli, onions active. Citrus trees in full bloom as late harvest continues. Irrigated melons up and growing well. Planting bell peppers, cucumbers, tomatoes. Pecan trees beginning to leaf out south; breaking buds from central to upper coast. In north buds beginning to swell. Peach trees set fruit in south; reached petal fall stage upper coast through central, pink bud stage to full bloom east and north.

Pasture beginning to green up, grazing increasing; livestock feeding remains active. Lice reported infesting livestock east. Lambing, calving continue. Goat shearing remains active.

UTAH: Fair and mild; series of moderate to heavy storms principally north and west weekend. Temperatures much above normal but cooling weekend. Averages range between 5 and 13° above normal.

Soil moisture adequate for current needs of range and dryland crops except few scattered localities southeast. Livestock doing well on ranges improved by moisture. Spring calving and lambing continued. Conditions good for fieldwork except rainy weekend. Warm weather encouraged up to three week early blossoming of fruit trees. Fall grain, alfalfa and pasture grasses showing early spring growth.

VIRGINIA: Seasonal temperatures prevailed with well above normal temperatures weekend. Average temperatures in mid-50's, several degrees above normal. Extremes: upper 80's and low 30's. Precipitation light occurring on 27th and 28th, averaging less than 0.25 in.

Topsoil moisture adequate to surplus. Fieldwork: 2.7 days suitable. Activity one week behind usual. Seeding: corn 1%, 1% 1977, 1% average; tobacco plant beds 70%; potatoes 70% Eastern Shore. Fruit good to excellent. Buds swelling; green tip for apples, pink showing in peaches. Pruning active. Small grains, pastures, tobacco plant beds good. Some water damage in winter grain fields. Cabbage set, sweetpotato bedding Eastern Shore. Preparing for sweet corn and cucumber plantings Eastern Shore. Seeding spring oats north. Livestock fair to good, marketing feeder calves, grazing limited southwest and central area. Other activity: fertilizing, liming, land preparations, harrowing pastures, spraying herbicides on small grain.

WASHINGTON: West: Temperatures 4° above normal. Precipitation 0.40 in. above normal except 0.30 in. below normal east Cascade foothills.

Early spinach, beet, and mustard seed coming up. East: Temperatures 6° above normal. Precipitation normal except 0.10 in. below in northeast and 0.30 in. below Palouse/Blue Mountains.

Cherries bloomed, pears approaching bloom. Apples approaching tight cluster. Weeds a problem because of lessened competition due to later seeding and optimum surface moisture. Grasses in excellent condition.

WEST VIRGINIA: Temperatures above normal. Extremes: 83 and 21°. Precipitation above normal northeast, below normal elsewhere.

Soil moisture surplus to adequate. Feed supplies: hay short, grain adequate. Farm activities: fence repair, plowing.

WISCONSIN: Temperatures above normal with record highs in upper 70's and lower 80's west and south 31st. Extremes: 81 and 16°. Precipitation generally light, ranging from 0.10 to 0.40 in. Scattered showers and thundershowers 27th to 28th. Light snow north 29th, sleet and freezing rain 2d. Most snow cover gone and much frost out of ground. Little field activity yet.

WYOMING: Temperatures above normal. Precipitation below normal. Precipitation ranged from none to 0.14 in. Some snow remains in mountain areas.

Topsoil moisture adequate. Acreage planted: spring wheat and oats 6%; barley 4%. Wet fields slowing land preparation and planting. Winter wheat mostly good to excellent, some light wind damage. Calving, lambing, shearing slightly ahead of normal. Spring calves dropped 49%; farm flock ewes lambed 65%; range ewes lambed 26%; farm flock shorn 59%; range sheep shorn 29%. Death losses for calves and lambs light to normal.

World Weather and Crop Update

March 27 - April 2

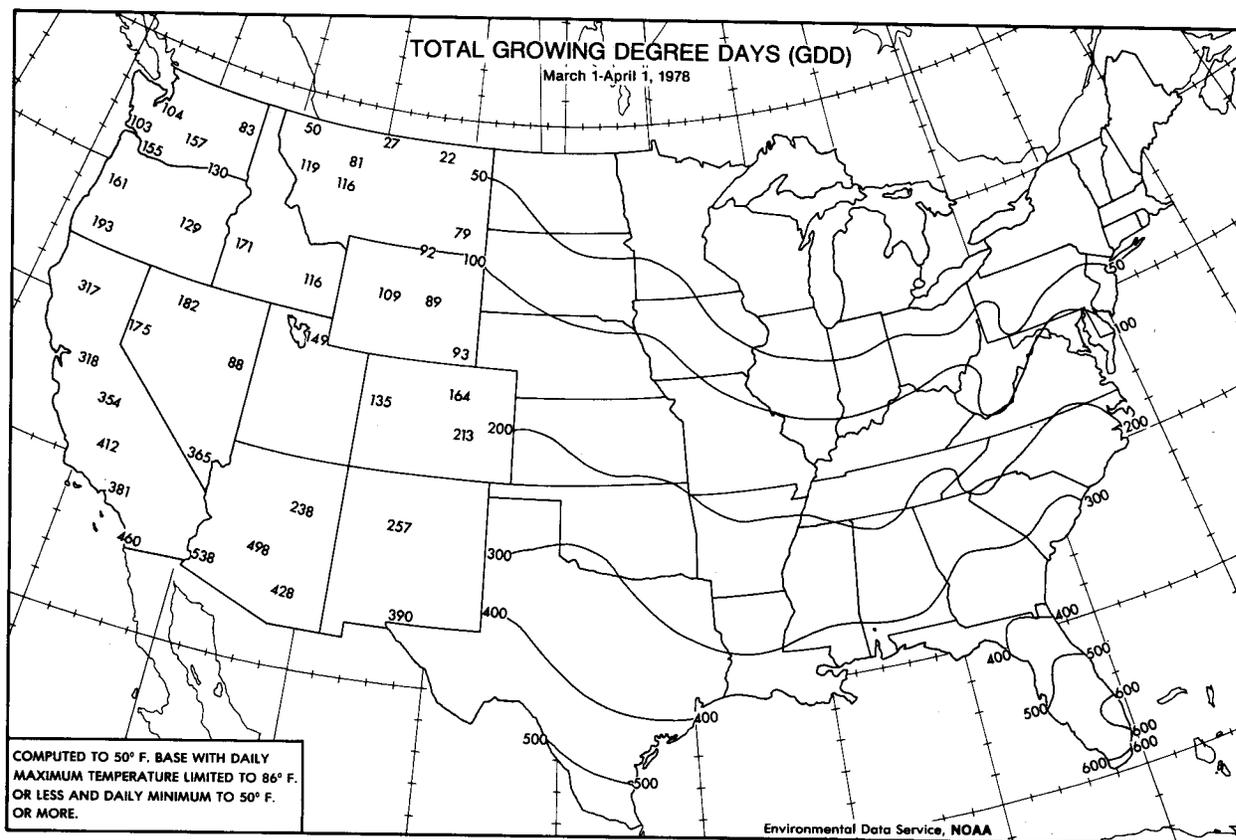
USSR. Mild temperatures with generally light to moderate precipitation throughout European USSR favored fieldwork; spring sowing is now well underway in many southern regions. Snow cover disappeared over most of the important agricultural regions as temperatures registered consistently above normal for several weeks. Winter grains resumed growth under favorable conditions over most of the southern half of European USSR including the Ukraine and the central Black Soil region. Above-normal temperatures also prevailed in the main spring wheat areas of western Siberia and northern Kazakhstan with daytime readings well

above freezing. Precipitation in these areas was very light, but accumulated moisture over the past seven months was normal or above.

AUSTRALIA. Showers and thunderstorms pelted most of the principal grain regions in Queensland, New South Wales, and Victoria. But South Australia received only scattered, light rainfall, and there was little significant moisture in West Australia.

ASIA. In the People's Republic of China, light frost occurred in the main winter wheat belt of

(continued on page 10)



USING THE GROWING DEGREE DAY

Plants grow, develop, and produce best within a certain range of air temperature. At temperatures above or below this range, heat or cold can hinder plant productivity. Within these limits, there is a direct relationship between temperature and the speed a plant develops.

The range of temperature for growth varies with the type of plant. For corn and soybeans, the apparent limits are about 50 and 86°, and for small grains, 40 and 90°. Each degree of temperature above the minimum for growth contributes to development of the crop and is called a growing degree day (GDD) unit.

To calculate the GDD accumulation for a certain day:

$$GDD = \frac{\text{daily maximum (86°)} + \text{daily minimum (50°)}}{2.0} - 50°$$

Use 86° for maximum temperatures above 86° because above that point heat does not contribute to crop development. For minimums below 50° use 50°; temperatures below this level stop development.

The Weekly Weather and Crop Bulletin introduced this method for calculating GDDs in 1969 and starting with this issue, will publish GDD data for the 1976/77 season. In 1970, the hybrid seed corn

industry adopted the GDD unit as a common basis for evaluating crop maturity.

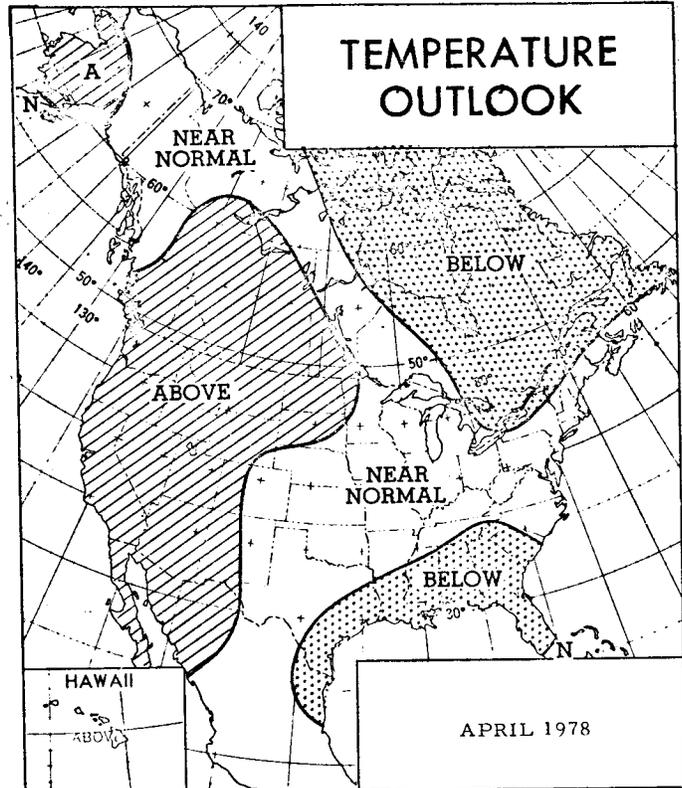
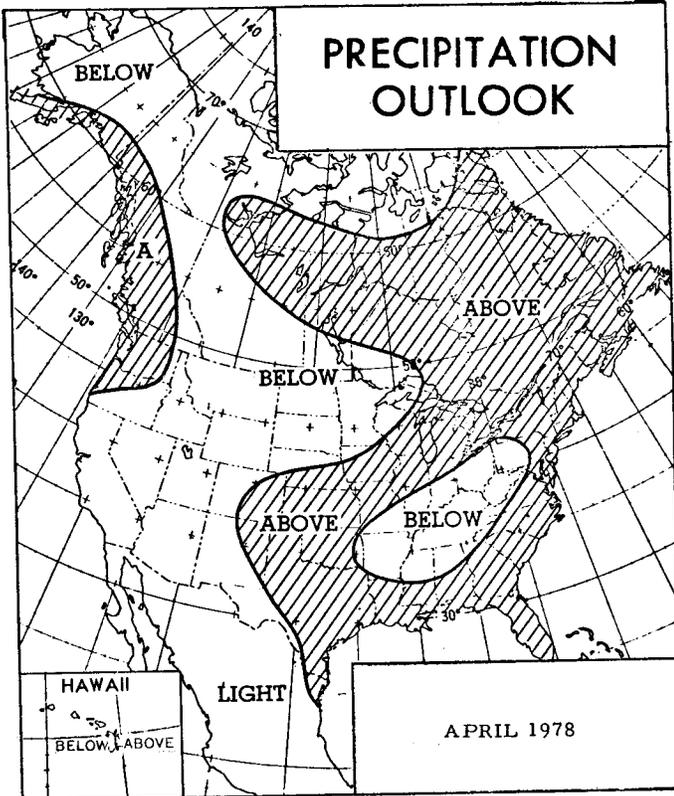
GDD information has many uses. A grower who knows the expected growing degree day accumulation can select varieties that utilize the entire growing season, and minimize the risk of frost damage. If adverse weather delays planting, a grower can select other varieties. In the same way, GDD information is useful if reseeding is required and also helps in the selection of seed.

After selecting and planting the seed, the grower can follow crop development or progress of the growing season. First, the grower should note the number of GDDs accumulated at the time of planting from the map on this page. This value is the base figure.

For example, assume 350 GDDs had accumulated at planting time. If as of a certain date, 1,200 GDDs had accumulated, only 850 contributed to development of the crop. If the variety requires 2,400 to mature, 1,550 still are needed before the crop is safe from frost. Use a table of normals in the same way to determine if the season is progressing normally.

The Bulletin occasionally will publish a separate map indicating the GDD departures from normal.

Average Monthly Weather Outlook



FORECAST ACCURACY IN THE NATIONAL WEATHER SERVICE

How good are National Weather Service forecasts? The results show a good rate. Below is a collection of statistics on the quality of recent temperature and precipitation forecasts averaged over at least 50 cities in the 48 conterminous States.

Forecast Period	Temperature Mean Absolute Error (°F)	Precipitation Percent Correct*
6-18 hr (1st period)	3.3	86.6
18-30 hr (2nd period)	3.7	84.9
30-42 hr (3rd period)	4.1	83.6
Day 3	5.7	Est. 75
Day 4	6.3	" 70
Day 5	6.8	" 65

The extended range forecasts may be verified in terms of the percent of the country forecast in the correct class. The forecasts are expressed in terms of 3 classes--below normal, normal and above

(continued from page 8)

North China. Some light damage may have been sustained by plants that are somewhat more vulnerable to spring frosts because of the generally advanced stage of growth resulting from the mild winter. Heavy rains in the southern rice growing areas---not unusual for this time of year---reportedly are causing some localized problems in rice seedling nurseries as transplanting of rice gets underway in Kwangtung, the PRC's leading rice province. Harvest of wheat and other rabi (spring and early summer harvested crops) is now underway in India.

normal--and averaged over 5-day periods. The outcome is presented below. In practice, the scores are compared with climatological "chance" forecasts.

Forecast Period	Temperature % Correct vs. Chance	Precipitation % Correct vs. Chance
Mean Days 1-5	70 vs. 34	50 vs. 35
Mean Days 6-10	56 vs. 34	39 vs. 35

Results for long range outlooks (30-day or seasonal outlooks), especially for temperature, have been quite encouraging in recent years. Mean 30-day and seasonal temperature anomaly forecasts are about 60 to 65% correct. Mean 30-day precipitation anomaly outlooks have been about 55% correct.

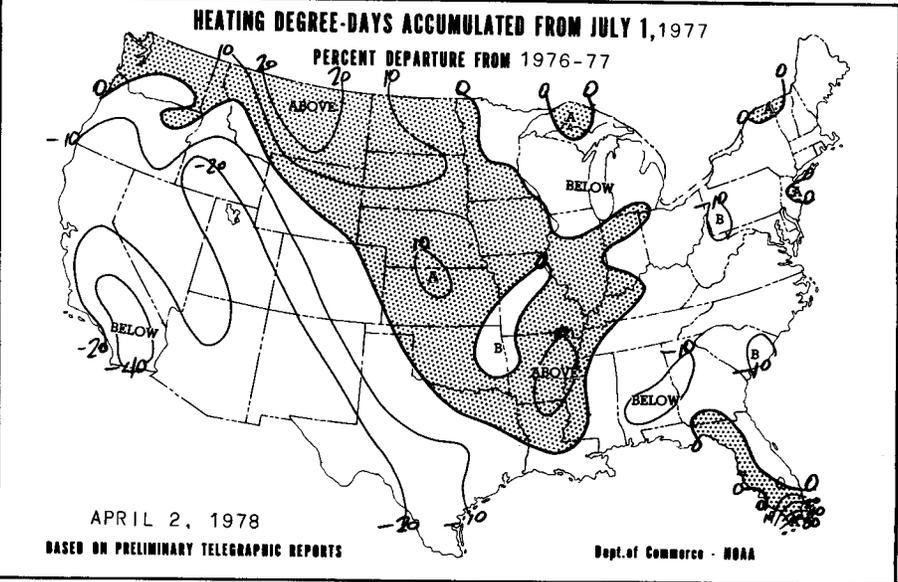
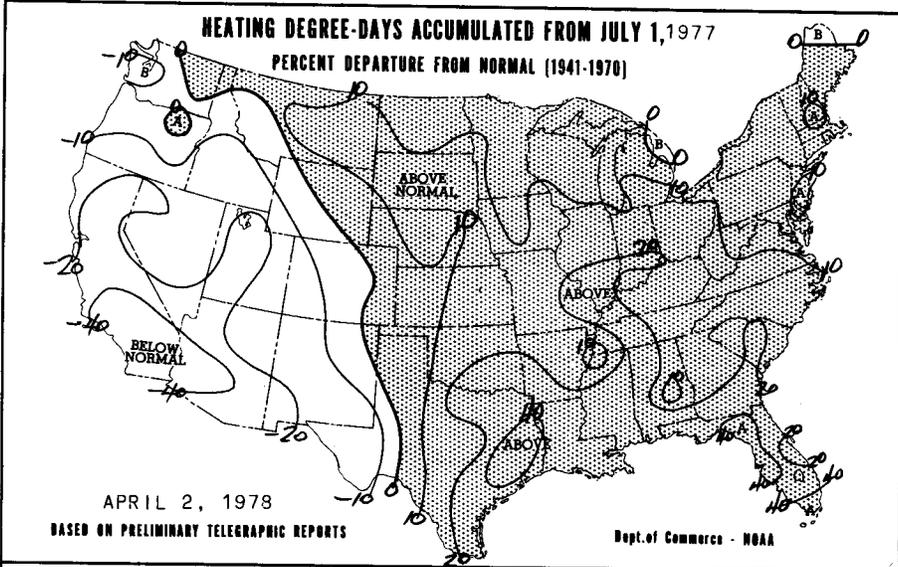
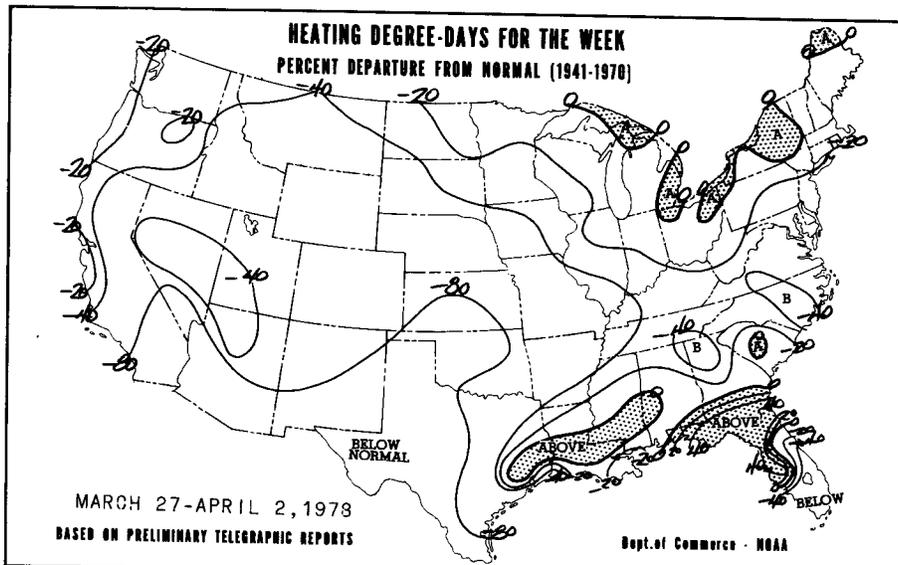
National Weather Service
Technical Procedures Branch

*Forecasts of probability of precipitation of at least 50% are treated as "Yes" forecasts of precipitation and of less than 50% as "No precipitation" forecasts.

Cool weather in March materially aided crop development while retarding disease infestation. Scattered showers and thunderstorms dotted some areas in the north last week, but most of India was seasonally dry.

AFRICA. Beneficial rains were recorded over widespread areas in North Africa. The heaviest amounts dampened eastern Algeria (15 to 25 mm) and Tunisia (20 to 40 mm). Growing conditions continued favorable in South Africa as showers and

(continued on last page)



HEATING DEGREE DAYS (BASE 65°) FOR WEEK ENDING APR. 2, 1978.

STATES AND STATIONS	WEEKLY SEASONAL ACCUMULATION +			STATES AND STATIONS	WEEKLY SEASONAL ACCUMULATION +			STATES AND STATIONS	WEEKLY SEASONAL ACCUMULATION +		
	TOTAL	DEPARTURE*	DEPARTURE FROM 1976-77		TOTAL	DEPARTURE*	DEPARTURE FROM 1976-77		TOTAL	DEPARTURE*	DEPARTURE FROM 1976-77
ALA. BIRMINGHAM.....	5	32	57	MAINE. CARIBOU.....	25	9	81	PA. ALLENTOWN.....	11	39	54
MOBILE.....	5	32	57	PORTLAND.....	116	116	815	ERIE.....	91	44	63
MONTGOMERY.....	5	32	57	MD. BALTIMORE.....	79	40	454	HARRISBURG.....	88	44	63
ARIZ. FLAGSTAFF.....	4	46	112	MASS. BOSTON.....	128	26	496	PHILADELPHIA.....	99	17	99
PHOENIX.....	4	46	112	MICH. ALPENA.....	111	18	72	PITTSBURGH.....	11	17	99
TUCSON.....	5	46	112	DETROIT.....	111	18	72	SCRANTON.....	14	39	54
YUMA.....	5	46	112	FLINT.....	111	18	72	S. C. CHARLESTON.....	37	5	23
ARK. FORT SMITH.....	1	107	482	GRAND RAPIDS.....	109	46	85	GREENVILLE.....	50	20	20
LITTLE ROCK.....	1	107	482	HOUGHTON LAKE.....	109	46	85	S. DAK. ABERDEEN.....	47	5	23
CALIF. BAKERSFIELD.....	1	107	482	LANSING.....	109	46	85	HURON.....	18	1	1
EUREKA.....	1	107	482	ROCHESTER.....	109	46	85	RAPID CITY.....	12	1	1
FRESNO.....	1	107	482	S. STE. MARIE.....	109	46	85	SIOUX FALLS.....	12	1	1
LOS ANGELES.....	1	107	482	MINN. DULUTH.....	109	46	85	TENN. CHATTANOOGA.....	4	30	37
RED BLUFF.....	1	107	482	INTERNAT. FALLS.....	109	46	85	KNOXVILLE.....	4	30	37
SAN DIEGO.....	1	107	482	WINNEAPOLIS.....	109	46	85	MEMPHIS.....	4	30	37
SAN FRANCISCO.....	1	107	482	ROCHESTER.....	109	46	85	NASHVILLE.....	4	30	37
STOCKTON.....	1	107	482	ST. CLOUD.....	109	46	85	TEXAS. ABILENE.....	2	5	5
COLO. DENVER.....	61	107	482	MISS. JACKSON.....	32	127	281	AMARILLO.....	2	5	5
GRAND JUNCTION.....	58	107	482	MERIDIAN.....	52	8	281	AUSTIN.....	2	5	5
PUEBLO.....	58	107	482	MO. COLUMBIA.....	52	8	281	BEAUMONT.....	2	5	5
CONN. BRIDGEPORT.....	34	17	50	ST. LOUIS.....	52	8	281	BRUNSWICK.....	2	5	5
HARTFORD.....	34	17	50	SPRINGFIELD.....	52	8	281	CORPUS CHRISTI.....	2	5	5
DEL. WILMINGTON.....	103	27	498	MONT. BILLINGS.....	85	109	708	DEL RIO.....	2	5	5
D.C. WASHINGTON.....	66	38	401	GLASGOW.....	85	109	708	FEL PASO.....	2	5	5
FLA. APALACHICOLA.....	37	14	183	GREAT FALLS.....	85	109	708	FORT WORTH.....	2	5	5
DAYTONA BEACH.....	37	14	183	HAVE.....	85	109	708	GALVESTON.....	2	5	5
FORT MYERS.....	37	14	183	HELIX.....	85	109	708	HOUSTON.....	2	5	5
JACKSONVILLE.....	37	14	183	KELSO.....	85	109	708	LUBBOCK.....	2	5	5
KEY WEST.....	37	14	183	MELISSA.....	85	109	708	MIDLAND.....	2	5	5
LAKELAND.....	37	14	183	MILLS CITY.....	85	109	708	ROANOK.....	2	5	5
MARI.....	37	14	183	MISSOULA.....	85	109	708	SEATTLE.....	2	5	5
ORLANDO.....	37	14	183	NEBR. GRAND ISLAND.....	61	103	634	SPOKANE.....	2	5	5
TALLAHASSEE.....	37	14	183	LYNDEN.....	61	103	634	HALLA HALLA.....	2	5	5
TAMPA.....	37	14	183	NORFOLK.....	61	103	634	YARIMA.....	2	5	5
WEST PALM BEACH.....	37	14	183	NORTH PLATTE.....	61	103	634	W. VA. BECKLEY.....	10	31	54
GA. ATLANTA.....	38	32	329	OMAHA.....	61	103	634	CHARLESTON.....	88	21	88
AUGUSTA.....	38	32	329	VALENTINE.....	61	103	634	HUNTINGTON.....	88	21	88
MACON.....	38	32	329	NEV. ELY.....	142	59	552	PARKERSBURG.....	111	6	111
SAVANNAH.....	38	32	329	LAS VEGAS.....	142	59	552	WIS. GREEN BAY.....	186	19	186
IDAHO. BOISE.....	67	77	428	RENO.....	142	59	552	LACROSSE.....	186	19	186
LEWISTON.....	67	77	428	WENNERUCCA.....	142	59	552	MADISON.....	186	19	186
POCATELLO.....	67	77	428	N. H. CONCORD.....	200	10	709	MILWAUKEE.....	186	19	186
ILL. CAIRO.....	29	57	466	N. J. ATLANTIC CITY.....	99	35	477	WYO. CASPER.....	98	107	613
CHICAGO.....	29	57	466	TRENTON.....	104	28	505	CHEYENNE.....	98	107	613
MOLINE.....	29	57	466	N. MEX. ALBUQUERQUE.....	54	51	354	LANDER.....	86	114	644
PEORIA.....	29	57	466	ROSELLE.....	54	51	354	SHERIDAN.....	86	114	644
ROCKFORD.....	29	57	466	N. Y. ALBANY.....	180	207	208				
SPRINGFIELD.....	29	57	466	BINGHAMTON.....	180	207	208				
IND. EVANSVILLE.....	64	43	511	BUFFALO.....	180	207	208				
FORT WAYNE.....	64	43	511	NEW YORK.....	180	207	208				
INDIANAPOLIS.....	64	43	511	ROCHESTER.....	180	207	208				
SOUTH BEND.....	64	43	511	SYRACUSE.....	180	207	208				
IOWA. BURLINGTON.....	116	36	642	N. C. ASHEVILLE.....	74	23	428				
DES MOINES.....	116	36	642	CHARLOTTE.....	74	23	428				
DUBUQUE.....	116	36	642	GREENSBORO.....	74	23	428				
STOUC CITY.....	116	36	642	HATTERAS.....	74	23	428				
KANS. CONCORDIA.....	32	108	573	RALEIGH.....	74	23	428				
DODGE CITY.....	32	108	573	WILMINGTON.....	74	23	428				
GOODLAND.....	32	108	573	N. DAK. BISHARCK.....	145	66	662				
TOPEKA.....	32	108	573	FARGO.....	145	66	662				
WICHITA.....	32	108	573	HILLSTON.....	145	66	662				
KY. LEXINGTON.....	82	32	508	OHIO. AKRON-CANTON.....	145	66	662				
LOUISVILLE.....	82	32	508	CINCINNATI.....	145	66	662				
LA. BATON ROUGE.....	27	191	353	CLEVELAND.....	145	66	662				
LAKE CHARLES.....	27	191	353	COLUMBUS.....	145	66	662				
NEW ORLEANS.....	27	191	353	DAYTON.....	145	66	662				
SHREVEPORT.....	27	191	353	TOLEDO.....	145	66	662				

BASED ON 1941-70 NORMALS.

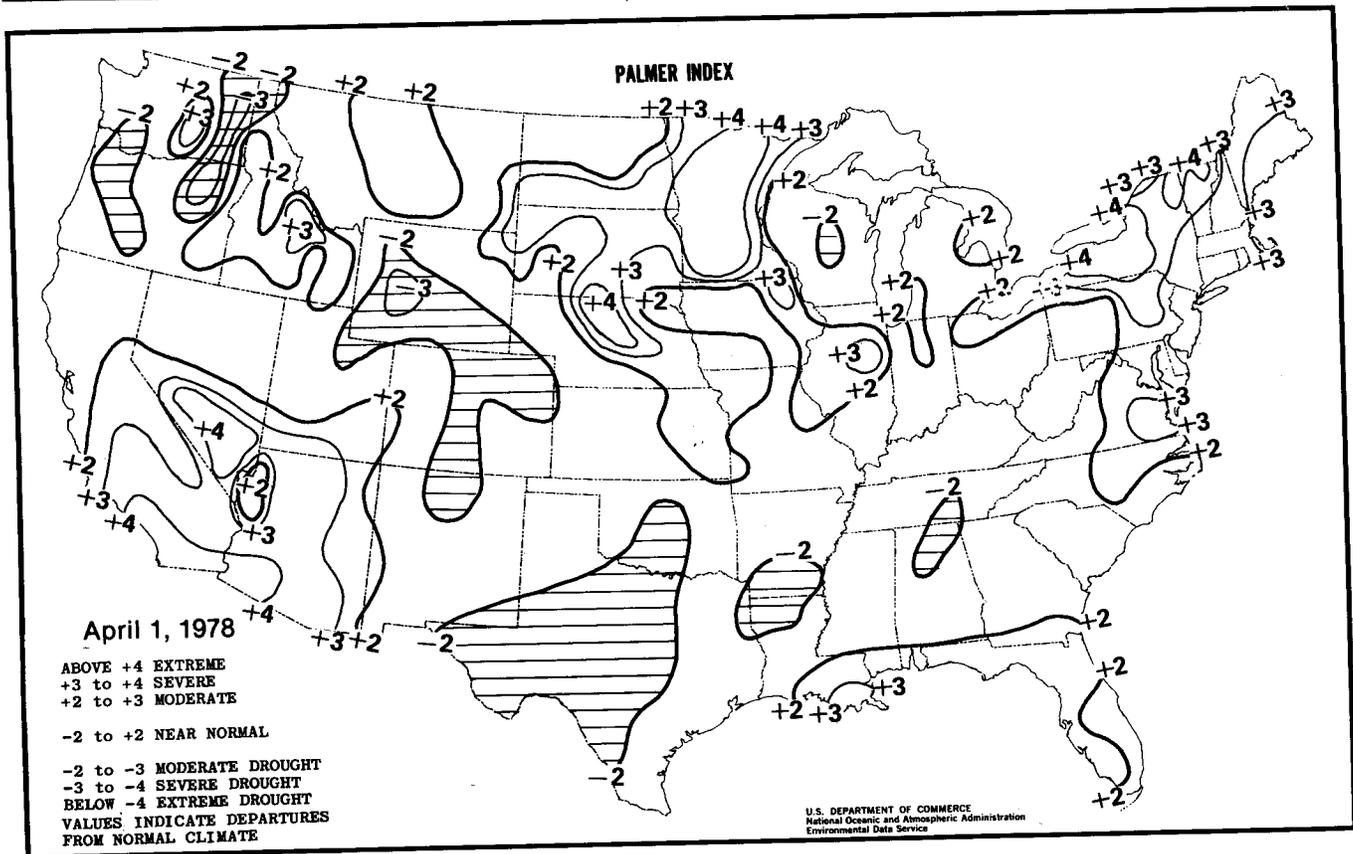
+ ACCUMULATION FROM JULY 1, 1977.

Heating Degree Days (Base 65° F.)

March 1978

ALA. Birmingham	452	MAINE, Caribou	1364	OKLA. Okla. City	493
Mobile	268	Portland	1071	Tulsa	541
Montgomery	326	MD. Baltimore	715	OREG. Astoria	551
ALASKA, Anchorage	1100	MASS. Boston	885	Burns U.	656
Barrow	2343	Chatham	942	Medford	444
Fairbanks	--	MICH. Alpena	1245	Pendleton	593
Juneau	954	Detroit	1027	Portland	485
Nome	1682	Flint	1178	Salem	513
ARIZ. Flagstaff	756	Grand Rapids	1140	PA. Allentown	871
Phoenix	67	Houghton Lake	1276	Erie	1143
Tucson	145	Lansing	1215	Harrisburg	810
Winslow	448	Marquette U.	1156	Philadelphia	797
Yuma	34	S. Ste. Marie	1343	Pittsburgh	860
ARK. Fort Smith	537	MINN. Duluth	1212	Scranton	984
Little Rock	499	Internatl Falls	1436	R. I. Providence	964
CALIF. Bakersfield	82	Minneapolis	1080	S. C. Charleston	309
Eureka U.	347	Rochester	1131	Columbia	418
Fresno	143	St. Cloud	1169	Greenville	486
Los Angeles U.	103	MISS. Jackson	377	S. DAK. Aberdeen	1228
Red Bluff	187	Meridian	457	Huron	1099
Stockton	191	Vicksburg U.	--	Rapid City	912
San Diego	52	MO. Columbia	842	Sioux Falls	1063
San Francisco	238	Kansas City	848	TENN. Chattanooga	467
COLO. Denver	665	St. Louis	840	Knoxville	487
Grand Junction	561	Springfield	766	Memphis	454
Pueblo	653	MONT. Billings	933	Nashville	556
CONN. Bridgeport	904	Glasgow	1252	TEX. Abilene	337
Hartford	921	Great Falls	966	Amarillo	551
D. C. Washington	633	Havre	1108	Austin	225
FLA. Apalachicola	264	Helena	807	Beaumont	179
Ft. Myers	69	Kalispell	934	Brownsville	66
Jacksonville	221	Miles City	1027	Corpus Christi	101
Key West	10	Missoula	771	Dallas	--
Lakeland U.	89	NEBR. Grand Island	914	Del Rio	111
Miami	35	Lincoln	972	El Paso	199
Orlando	115	Norfolk	965	Fort Worth	346
Daytona Beach	132	North Platte	924	Galveston U.	205
Tallahassee	271	Omaha	963	Houston	250
Tampa	99	Valentine	993	Lubbock	419
GA. Atlanta	412	NEV. Ely	742	Midland	245
Augusta	381	Las Vegas	168	San Angelo	286
Macon	321	Reno	545	San Antonio	192
Savannah	283	Winnemucca	566	Victoria	167
IDAHO, Boise	500	N. H. Concord	1138	Waco	284
Lewiston	531	N. J. Atlantic City	824	Wichita Falls	394
Pocatello	678	Trenton U.	800	UTAH, Milford	611
ILL. Cairo U.	670	N. MEX. Albuquerque	454	Salt Lake City	522
Chicago	1003	Roswell	294	VT. Burlington	1202
Moline	986	N. Y. Albany	1051	VA. Lynchburg	637
Peoria	1006	Binghamton	1150	Norfolk	580
Rockford	1101	Buffalo	1130	Richmond	627
Springfield	968	New York	812	Roanoke	637
IND. Evansville	774	Rochester	1087	WASH. Colville	789
Fort Wayne	1051	Syracuse	1097	Omak	--
Indianapolis	873	N. C. Asheville	586	Quillayute	601
South Bend	1041	Charlotte	473	Seattle-Tacoma	498
IOWA, Burlington	994	Greensboro	605	Spokane	701
Des Moines	988	Hatteras R.	455	Walla Walla U.	479
Dubuque	1122	Raleigh	514	Yakima	588
Sioux City	1007	Wilmington	419	W. VA. Beckley	801
KANS. Concordia	803	N. DAK. Bismarck	1143	Charleston	691
Dodge City	630	Fargo	1284	Huntington	698
Goodland	782	Williston U.	1148	Parkersburg U.	788
Topeka	824	OHIO, Akron-Canton	1013	WIS. Green Bay	1227
Wichita	663	Cincinnati U.	880	Madison	1096
KY. Lexington	766	Cleveland	1005	Milwaukee	1086
Louisville	720	Columbus	928	WYO. Casper	854
LA. Baton Rouge	258	Dayton	927	Cheyenne	840
Lake Charles	236	Toledo	1121	Lander	823
New Orleans	191	Youngstown	1030	Sheridan	951
Shreveport	374				

Preliminary reports from airport locations, except those marked U for urban and R for rural.
*Estimated.



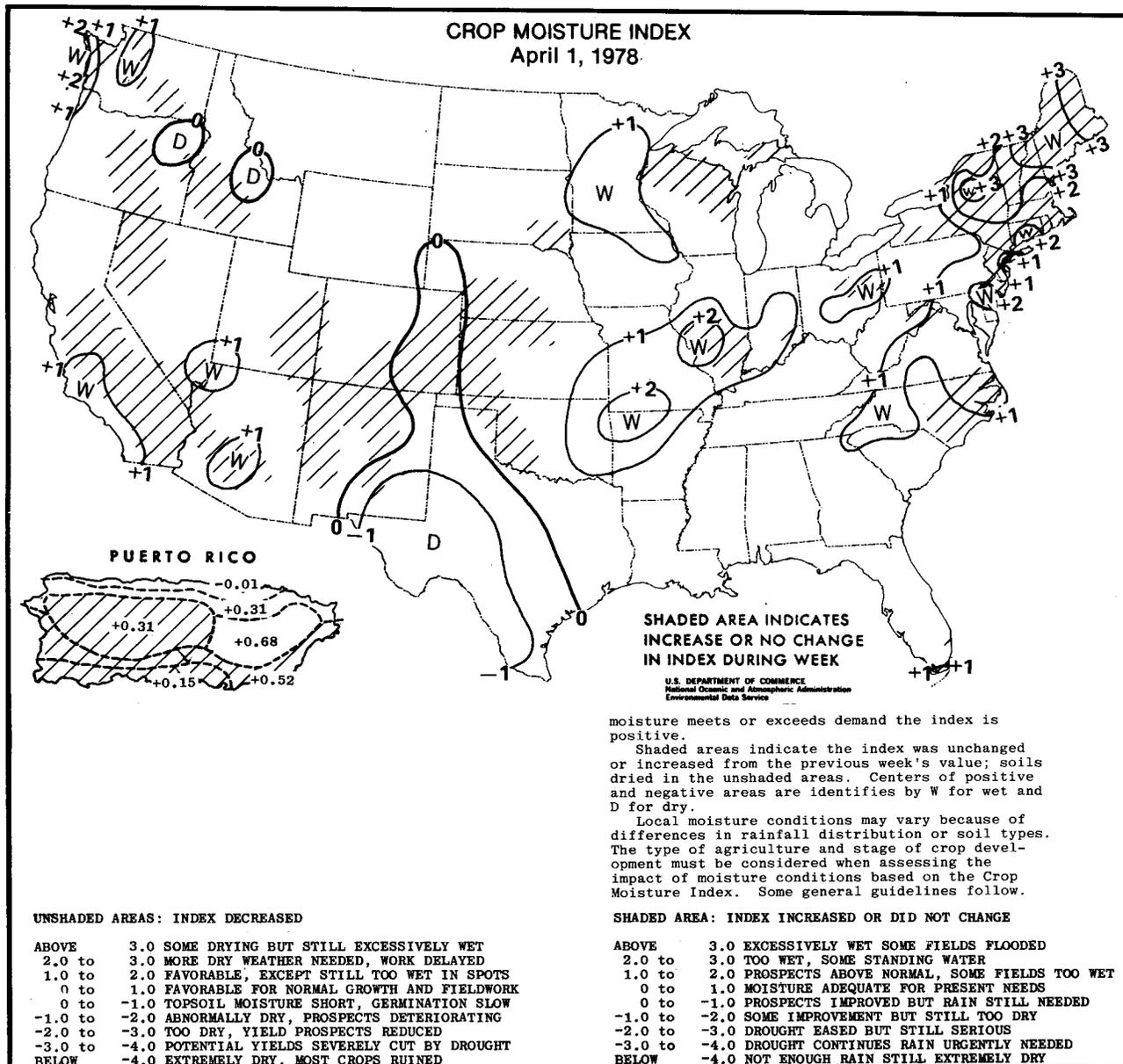
The Palmer Index

The Palmer Index is an index of meteorological drought, which may be defined as a prolonged and abnormal moisture deficiency. The general concept is one of supply and demand. Supply is represented by precipitation and stored soil moisture. Demand is the combination of potential evapotranspiration, the amount needed to recharge the soil moisture, and the runoff needed to keep the rivers, lakes, and reservoirs at a normal level. The results of this water balance accounting produce a positive or negative anomaly which is then weighted by a climate factor. The final product is an index that expresses the abnormality for that particular place for the period of time being computed. This manipulation allows the index to have a reasonably comparable local significance in space and time, that is, a certain index value obtained for a division in New York would have the same local significance as a like value in the more arid areas of western Kansas. This monthly increment is added to a portion of the previous month's index to include the duration of the anomaly in the final index.

The Palmer Index was designed as a climatological indicator of the scope and severity of past droughts. Using the Palmer Index on a real-time basis presents difficulties. A day or so of normal or better rainfall is certainly welcome in an area that has experienced a long drought, but one cannot know whether it indicates the end of the drought or just a brief respite. In order to

make the program have some real-time value, a system of computing a "probability" that a weather spell has ended was devised. This is not entirely satisfactory, but does allow one to assign a definite index value at times when there may be some doubt as to whether it should be positive (wet) or negative (dry).

Another aspect of using the Palmer Index is that one must remember that the demand part of the computations includes three parameters---potential evapotranspiration, recharge of soil moisture, and runoff, any one of which may produce a negative index. For instance if only enough rain fell to satisfy most of the expected evapotranspiration, but not enough to supply the expected recharge and runoff, then a negative index would result. If such a situation continued then one might find that agriculture was progressing at a near normal pace but the Palmer Index would be indicating a worsening drought. In this situation the drought would cause shallow wells and springs to go dry and the levels of rivers, lakes and reservoirs to fall below normal and, if this odd situation continued long enough, would cause serious economic stress to the livestock industry and eventually to other industries and cities. Then if rainfall fell below the minimum needed for agriculture, crops would suffer drastic and rapid decline because there would be no reserve water in the soil. Such a situation, to some extent, occurred during the Northeast drought in the 1960's when New York City almost ran out of water.



The Crop Moisture Index

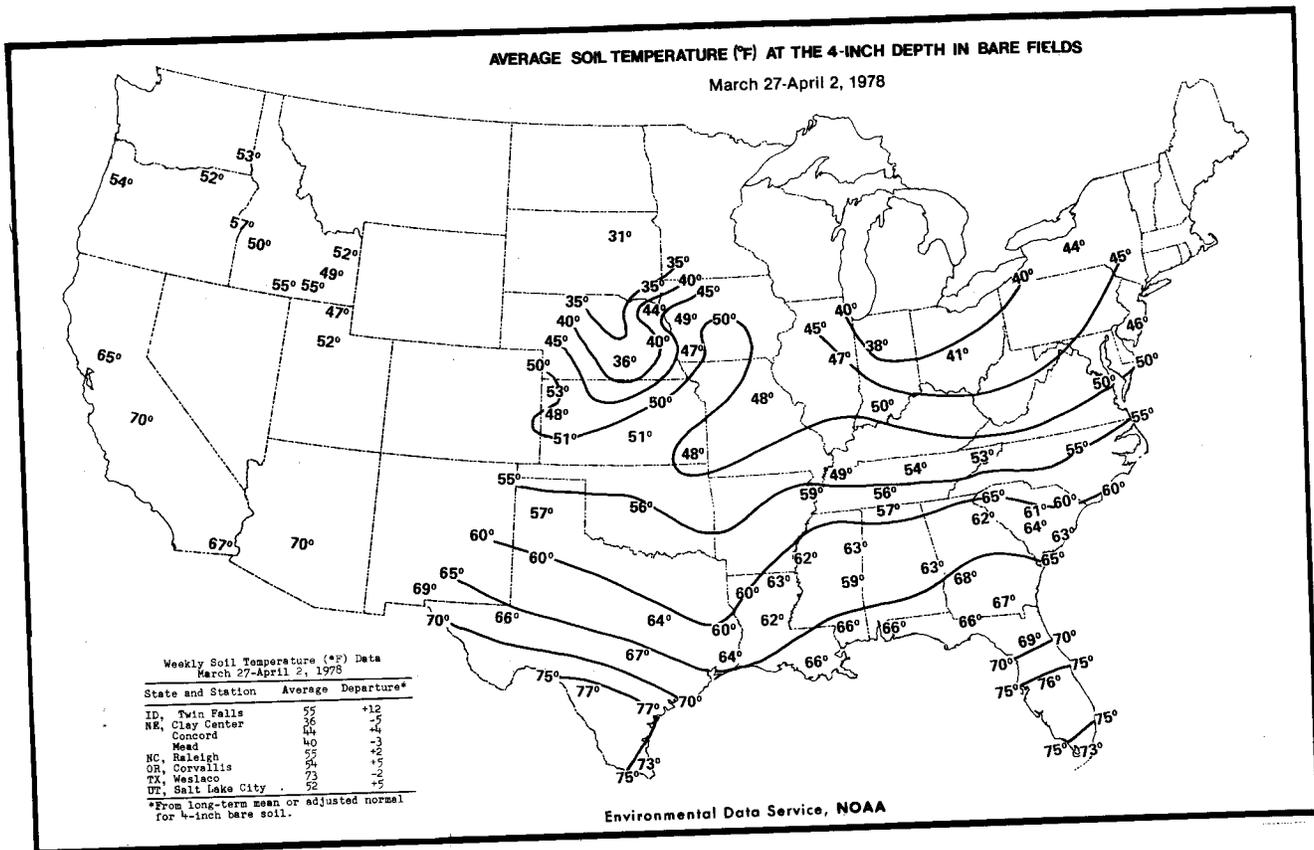
The Palmer Drought Index (PI) was designed as a climatological tool for evaluating prolonged periods of abnormally dry weather and, for this purpose it works quite well. However, for the reasons outlined in the description of the Palmer Index, certain insufficiencies and misuses developed. Because of the need for an index that measures only the current status of purely agricultural drought, the Crop Moisture Index was developed from some of the moisture accounting procedures used in computing the Palmer Index.

In its simplest terms agricultural drought is an evapotranspiration deficit. However, when viewed in any detail the problem of agricultural drought becomes quite complicated. Local differences in soils, types of crops, stage of development, and other variables make it near impossible to produce a single index which applies in all these variations. The Crop Moisture Index (CMI)

compares the actual evapotranspiration that results from the current moisture supply (precipitation and stored moisture) to the evapotranspiration that would be normally expected in that climate under the current weather conditions. The resulting anomaly is then weighted to make it an index that is comparable in space and time. It is necessary to use two separate legends with the CMI because the resulting effects are different when the moisture supply is improving than when it is deteriorating. The CMI applies only to the broad-scale general picture of the current crop moisture situation in agriculture areas. It does not consider past conditions except the recent period that affects the current moisture supply. The CMI is generally used in conjunction with the PI to get a subjective understanding of what is happening.



FIRST CLASS MAIL



(continued from page 10)

thunderstorms of moderate to heavy intensity---10 to 25 mm---fell throughout the maize triangle. Floods along the Zambezi river in Mozambique reportedly resulted in extensive damage to crops in some areas.

EUROPE. Temperatures neared normal, but frequent light rain hindered fieldwork in western Europe. Heavy rains drenched Mediterranean France and northern Spain; welcome rains fell in southern Italy. Mild and dry weather favored fieldwork and winter grain development in the northern half of eastern Europe. Light to moderate amounts of moisture fell in the Balkans, while Turkey's central grain belt received moderate to heavy precipitation.

SOUTH AMERICA. Generally good harvesting weather blessed Argentina, Uruguay and the extreme southern part of Brazil with only light precipitation recorded. Heavy rains in the previous two weeks in Argentina seriously hurt sunflowers and peanuts, but damage to soybeans was less serious. Moderate to heavy showers were scattered throughout Parana and Sao Paulo in Brazil with very heavy showers recorded in the eastern portions of both states extending into the adjacent states to the north. Rainfall was moderate to heavy in Minas Gerais, but precipitation in Bahia fell mainly along the coast.