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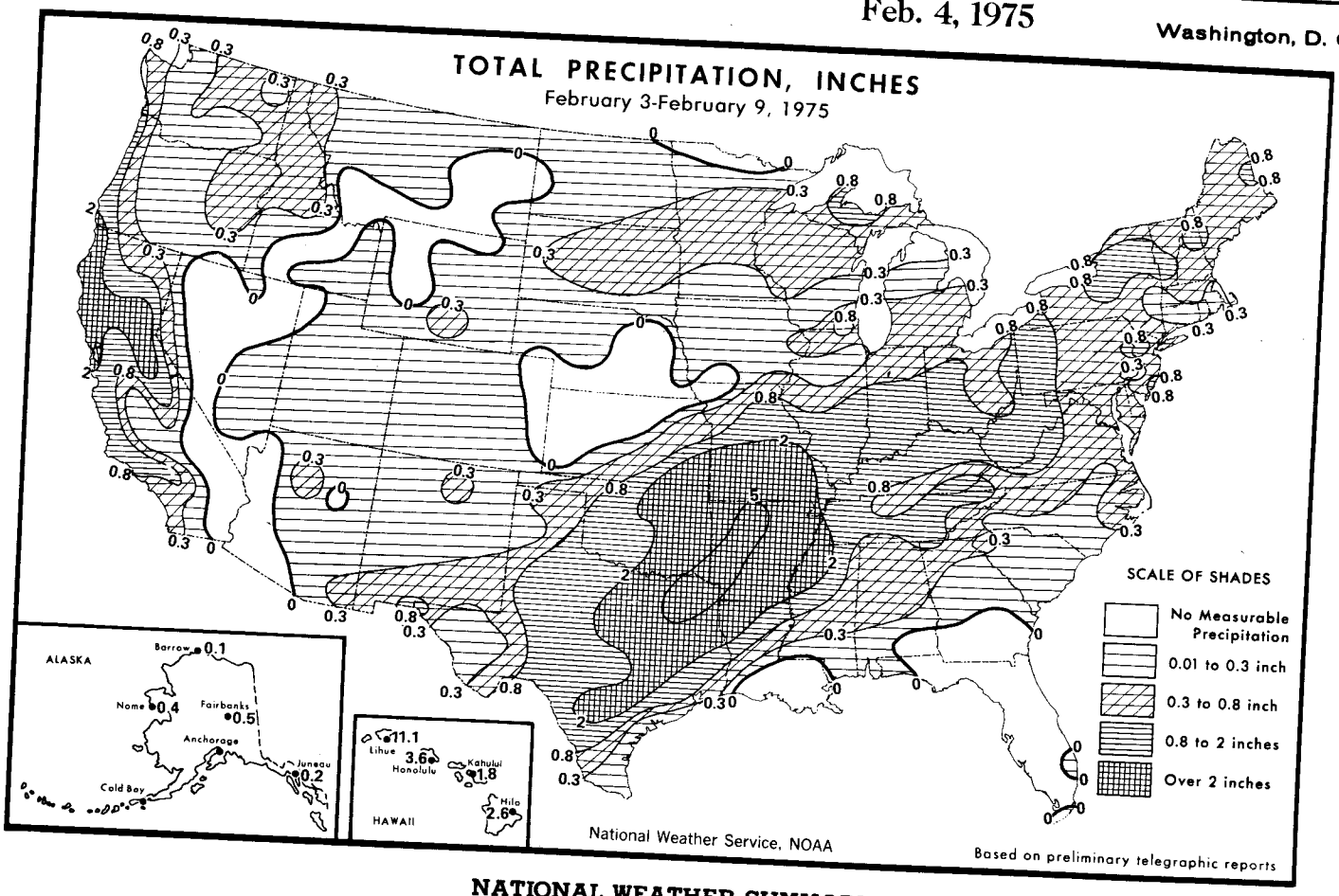


NATIONAL WEATHER SUMMARY

For the Week of January 27 - February 2

HIGHLIGHTS: Heavy precipitation fell along sections of the Pacific Coast and also across an adjoining five-state area including Missouri, Oklahoma, Arkansas, Louisiana, and Texas last week. The intense storms triggered some flooding in northeast Texas and Arkansas where weekly rainfall totals averaged 2.00 to 5.00 in. or better.

In the West, the heaviest precipitation, measuring more than 2.50 in. soaked the San Francisco-Red Bluff corridor in northern California with lesser amounts falling throughout most of the State.

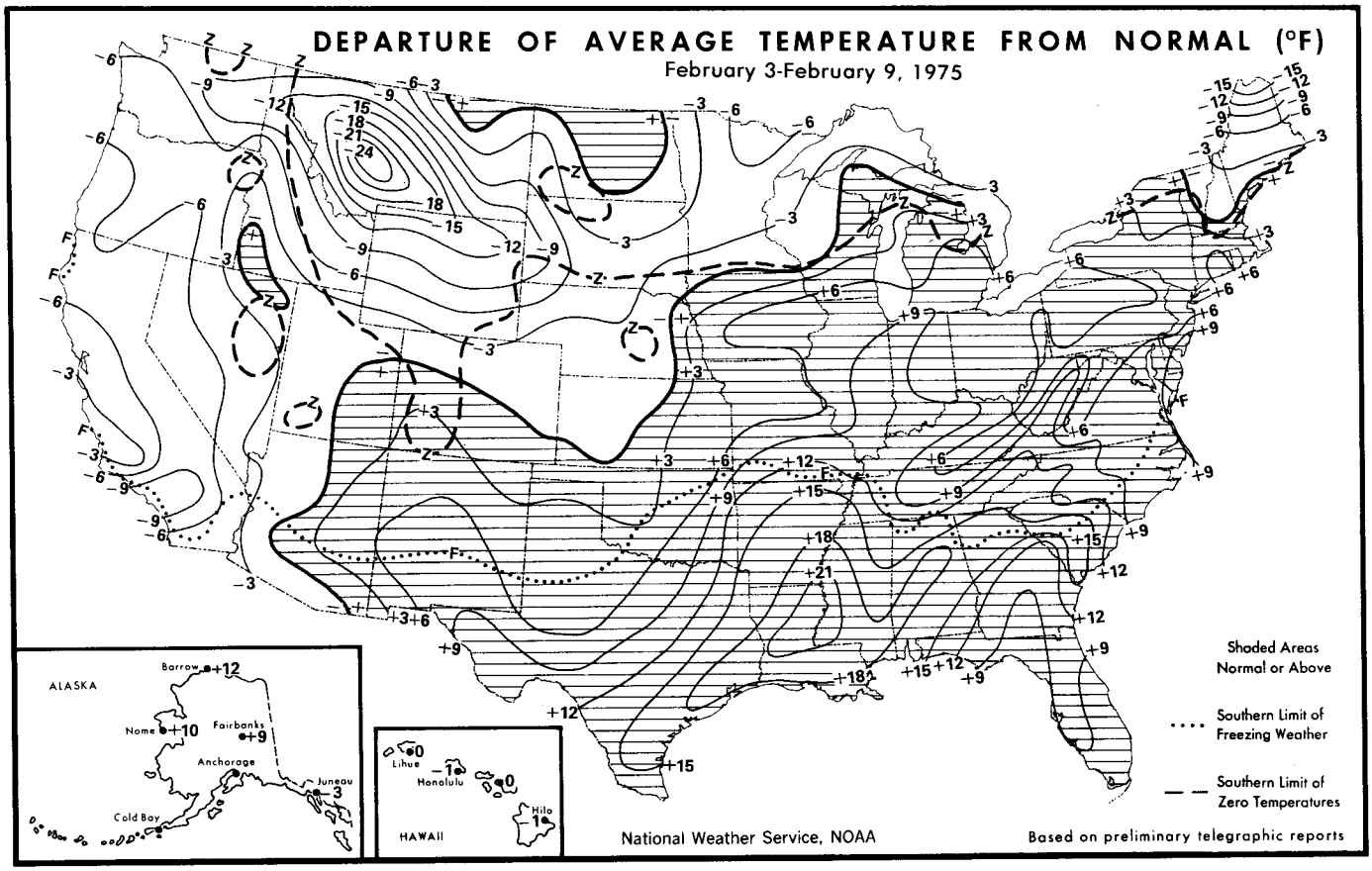
Sharply contrasting temperatures dominated the nation's weather last week. Vicksburg, Miss. reported weekly temperatures averaging 21° above normal, while an area in west central Montana reported bitter cold temperatures averaging 24° below normal for the week.

PRECIPITATION: Some precipitation fell across most of the Nation last week except for Florida. Only traces of precipitation were recorded along Florida's southern tip while the rest of the state remained dry. Elsewhere, storms spread heavy precipitation from Texas to Pennsylvania and along the West Coast.

Monday, a complex Low pressure system in the central Rockies triggered snow across the central and southern Rockies, Utah and Wyoming before drifting eastward.

A new Low pressure area moving into the West Coast brought scattered showers to the Oregon and northern California Coast on Tuesday. Meanwhile snow fell from the Cascades eastward through the northern Plateau, the north and central Rockies and portions of the southern Plateau.

Wednesday, a swiftly moving storm front from Canada swept across the upper midwest and northern Great Lakes dumping heavy snow in it's path. This Low pressure center, trailing a cold front southwestward, caused



showers and thundershowers along it as far south as northern Alabama.

By Thursday, the Low had moved off New England and out into the Atlantic but the trailing front extended through the south to southeast Texas. Another front began moving onto the entire West Coast.

Friday, the stationary front dropped locally heavy rains averaging 1.00 to 3.00 in. over sections of northeast Texas, eastern Oklahoma, southeast Kansas, southern Missouri and parts of Arkansas. Meanwhile, the Pacific frontal system triggered snow and rain along the upper half of the Pacific Coast.

Heavy rains continued over soggy central and eastern Texas causing flash flooding on Saturday. Dallas added over three-quarters of an inch for a total of 2.50 in. of rain in the past 24 hours. Elsewhere, the Pacific front brought rain and snow to the Pacific Northwest and most of California and then weakened as it moved into the mountains.

Sunday, the lingering stationary front triggered scattered rain and drizzle through the Gulf States into the Carolinas. The heaviest amounts fell in southern Arkansas, northeast Texas and northwest Louisiana. El Dorado, Ark. got 1.50 in. of precipitation during the afternoon making a total of more than 6.00 in. for the weekend. A wave on the front caused rain northward to southern Virginia and then snow into southern Pennsylvania.

TEMPERATURE: Frosty air invaded the Nation last week westward of a line from the Great Lakes to Arizona, pulling temperatures to below normal levels. In contrast, the rest of the Nation, except northern New England, enjoyed above normal temperatures. The highest temperature for the week, 88°, was recorded in Naples, Fla., Mineral Wells and Cotulla, Texas, while the week's low of 37° below zero froze Butte, Montana.

Monday, unusually warm 80° readings were recorded in the southern and eastern portions of Texas into Arkansas, Louisiana and Mississippi.

Fair skies in the South pushed temperatures to record high readings at Shreveport, La., 81°; Little Rock, Ark., 78°; Nashville, Tenn., 75°; Tampa, Fla., 84°; and Memphis, Tenn., 77° on Tuesday.

Wednesday, temperatures in the eastern and southern U.S. were unseasonably warm, from the lower Mississippi Valley to New York and the middle Atlantic States. A few record highs included Little Rock, Ark., 78°; Cincinncati, Ohio, 67°; and New York, N.Y., 54°.

A record high 80° reading was recorded at Augusta, Ga. on Thursday. While, a few places in the north parts of New York, North Dakota, Minnesota and Montana stayed in the single numbers all day.

Friday, unseasonably warm weather continued in the Nation's southeastern quarter sending temperatures soaring to record high levels. Record highs were set at Jacksonville, Fla., 83°; Wilmington, N.C., 82°; Tallahassee, Fla., 81° and Charleston, S.C., 81°.

Daytime temperatures on Saturday ranged from the 80's along the Gulf and South Atlantic Coast to the single numbers in Montana, North Dakota, and northern New England.

Sunday, much of the Nation from the Gulf Coast and the Rio Grande Valley northward was very warm late in the day with the thermometer still above the freezing mark as far north as Omaha, Nebr.

NATIONAL AGRICULTURAL SUMMARY

For the Week of January 27 - February 2

HIGHLIGHTS: Above normal temperatures in the South, prompted new winter wheat growth and farmers were busy moving livestock off the already overgrazed and muddy fields. Harvest of remaining cotton progressed early in the period and was virtually complete in Arkansas and 99% done in Texas. Freezing temperatures damaged the remaining Navel orange crop in California. Harvests of fruits and vegetables were maintained at seasonal levels.

SMALL GRAINS: Small grains continued in fair to good condition throughout much of the Nation, however some wind damage occurred in eastern Colorado and Wyoming, western Kansas and Nebraska, and northeastern New Mexico. Warm temperatures in the Southern States prompted new growth, while in California, general rains greatly benefited small grain plantings.

Above normal temperatures brought on new growth to winter wheat fields in Texas and Oklahoma, but in many areas the growth quickly disappeared from overgrazing. Farmers in Texas and Oklahoma were busy moving cattle off the overgrazed and muddy wheat fields. Wheat condition was variable in Kansas, ranging from very good in the south central and east to dry topsoil subject to blowing west and north central where there is sparse ground cover.

In Montana, snowcover on winter wheat was good, except over the eastern third of the State, while snow increased the protective cover on wheat fields in Washington. Moisture levels continue critical for winter wheat in eastern Colorado and Wyoming where fields are vulnerable to wind damage.

COTTON: Cotton harvest in Texas was nearing completion with a few fields remaining in the Low Plains, Cross Timbers, and Blacklands areas. Harvest of the State's cotton was also nearly complete last year and compares with the average of 97%. Warm sunny days early in the period allowed harvest completion in Arkansas and some progress in Oklahoma. Cotton cleanup was active in Arizona.

OTHER CROPS: Corn and soybean harvests were limited in Indiana by the soft field conditions and the frost depth. Soybean harvest in Oklahoma was maintained early in the week as rains halted most field activity later on.

Tobacco plant bed preparation continued active in the South Atlantic States. In North Carolina, farmers were gasing plant beds. Burley tobacco marketing was about finished in Kentucky, where only 2 markets remained open.

Sugarcane harvesting continued strong in Florida and new cane was making good growth.

Potato planting preparations progressed in the Trans-Pecos area of Texas while harvest continued in California and Florida. Potato movement from storage was slow in Idaho, Oregon, and Utah.

Wet conditions limited field activities in several States, but some plowing for spring crops and spreading fertilizer and lime occurred.

FRUITS AND NUTS: Freezing temperatures occurred in the lower San Joaquin Valley of California on the nights of January 27th through 30th damaging the Navel orange crop. However, it will be at least a week before the damage can be assessed. Temperatures dropped as low as 20° and the duration below 26° was up to 9 hours on the 28th. Temperatures dipped below 27° for 6 to 8 hours in southern California on the 28th and 29th, however, wet conditions and frost protection devices held damage to light amounts. Harvest of Navel oranges, tangerines, grapefruit, lemons and avocados continues at seasonal levels.

Citrus trees and fruit were in excellent condition in Florida. Warm temperatures were accelerating open bloom and new growth in most areas leaving them vulnerable to freezing temperatures.

Citrus harvest continued active in Texas. Orchard pruning activity in Maryland, Oregon, South Carolina, and Washington progressed generally on schedule.

VEGETABLES: Warm weather continues to hasten vegetable crop development in Florida, where all vegetable areas need rain. Early morning fogs are causing some disease problems, but nothing serious so far. Harvest was active on all vegetable crops and supplies continue at seasonal levels.

In California, artichokes were frosted again, but most other vegetable crops escaped the freezes. Harvest was active for broccoli, cauliflower, carrots and lettuce, while celery was slow due to the poor market.

Vegetable harvest in Texas was active for cabbage, carrots, and lettuce. Onions and spinach continue to make good growth. Land preparation and some planting were underway for cantaloup, honeydew melons and watermelon.

Harvest of cabbage and mixed greens increased in the coastal areas of South Carolina. In Alabama, cool-season vegetables were being planted.

PASTURES AND LIVESTOCK: Supplemental feeding was being maintained in most States because below normal range and pasture feed, snowcover, or muddy conditions limited grazing. Overgrazing has caused short pastures in Alabama and Georgia, while in Texas, livestock losses from malnutrition were increasing in the east and Blacklands areas. Recent rains in California aided prospects for adequate water and benefited range grasses. Calving and lambing increased in Idaho, Oregon, and Washington. Hay supplies below normal in Colorado, but are expected to be adequate to carry the needs for the rest of the season.

Temperature and Precipitation Data for the Week Ending Midnight, l.s.t., Feb. 2, 1975

States and Stations	Temperature °F Average	Temperature °F Departure	Precipitation Inches Total	Precipitation Inches Departure
ALA.Birmingham. . .	64	+19	.5	- .7
Mobile.	69	+17	T	-1.0
Montgomery. . . .	65	+16	.3	- .6
ALASKA.Anchorage. .	--	---	---	----
Barrow.	- 4	+12	.1	0
Fairbanks	0	+ 9	.5	+ .4
Juneau.	22	- 3	.2	- .7
Kodiak.	--	---	---	----
Nome.	16	+10	.4	+ .2
ARIZ.Flagstaff. . .	27	- 2	.8	+ .4
Phoenix	53	+ 1	T	- .1
Tucson.	52	0	.3	+ .2
Winslow	38	+ 3	T	- .1
Yuma.	53	- 4	T	- .1
ARK.Fort Smith. . .	53	+13	2.0	+1.3
Little Rock . . .	57	+16	3.2	+2.2
CALIF.Bakersfield .	48	- 2	.2	- .1
Eureka.	40	- 8	2.5	+1.0
Fresno.	42	- 5	.2	- .2
Los Angeles . . .	48	- 9	.8	0
Red Bluff	40	- 7	1.9	+ .9
San Diego	51	- 5	.4	0
San Francisco . .	45	- 4	2.7	+1.8
Stockton	42	- 4	.9	+ .3
COLO.Denver	30	- 1	T	- .1
Grand Junction. .	31	+ 2	.1	- .1
Pueblo.	33	+ 1	T	- .1
CONN.Bridgeport . .	34	+ 4	.5	- .1
Hartford.	32	+ 7	.3	- .5
D.C.Washington. . .	43	+ 7	.3	- .3
FLA.Apalachicola. .	62	+ 8	0	- .8
Daytona Beach . .	67	+ 8	0	- .6
Ft. Myers	73	+ 9	0	- .4
Jacksonville. . .	66	+11	0	- .8
Key West.	77	+ 6	T	- .4
Lakeland.	72	+11	0	- .6
Miami	75	+ 8	T	- .5
Orlando	70	+ 9	0	- .6
Tallahassee . . .	62	+ 9	0	-1.0
Tampa	70	+ 9	0	- .6
W.Palm Beach. . .	73	+ 8	.1	- .5
GA.Atlanta.	59	+16	.1	- .9
Augusta	57	+10	.1	- .7
Macon	61	+12	.1	- .8
Savannah.	66	+15	.3	- .3
HAWAII.Hilo	71	- 1	2.6	+ .2
Honolulu.	71	- 1	3.6	+2.8
Kahului	71	0	1.8	+1.0
Lihue	71	0	11.1	+9.8
IDAHO.Boise	31	0	.1	- .2
Lewiston.	29	- 5	.6	+ .3
Pocatello	18	- 7	T	- .2
ILL.Cairo	47	+10	1.4	+ .5
Chicago	31	+ 6	.3	- .1
Moline.	29	+ 7	.2	- .2
Peoria.	32	+ 7	.2	- .2
Rockford.	28	+ 7	.5	+ .1
Springfield . . .	36	+ 9	.7	+ .3
IND.Evansville. . .	44	+11	1.6	+ .8
Ft. Wayne	32	+ 6	.6	0
Indianapolis. . .	36	+ 8	1.4	+ .8
South Bend. . . .	33	+ 9	.6	+ .1
IOWA.Burlington . .	30	+ 6	.3	0
Des Moines. . . .	27	+ 7	T	- .2
Dubuque	25	+ 6	.1	- .2
Sioux City. . . .	19	0	T	- .2
KANS.Concordia. . .	27	- 1	T	- .2
Dodge City. . . .	32	0	T	- .1
Goodland.	28	- 1	T	- .1
Topeka.	34	+ 4	.4	+ .2
Wichita	36	+ 3	.6	+ .4
KY.Lexington. . . .	42	+ 9	1.2	+ .4
Louisville. . . .	43	+ 9	1.5	+ .7
La.Baton Rouge. . .	71	+19	0	-1.0
Lake Charles. . .	71	+18	T	-1.0
New Orleans . . .	71	+18	T	-1.1
Shreveport. . . .	65	+17	3.2	+2.3
MAINE.Caribou . . .	4	-15	.6	+ .1
Portland.	22	+ 1	.5	- .3
MD.Baltimore. . . .	40	+ 7	.3	- .3
MASS.Boston	32	+ 3	.3	- .5
Chatham	32	---	.4	----
MICH.Alpena	18	+ 1	.5	+ .1
Detroit	31	+ 6	.6	+ .2
Flint	31	+ 9	.6	+ .2
Grand Rapids. . .	27	+ 4	.6	+ .2
Houghton Lake . .	21	+ 4	.2	- .1
Lansing	29	+ 7	.7	+ .3
Marquette	19	+ 1	.8	+ .4
Muskegon.	28	+ 5	.4	- .1
S. Ste. Marie . .	10	- 4	.4	0
MINN.Duluth	4	- 5	.4	+ .2
Internatl Falls .	- 3	- 6	0	- .2
Minneapolis . . .	11	- 3	.4	+ .3
Rochester	13	0	.3	+ .2
St. Cloud	5	- 4	.4	+ .2
MISS.Jackson. . . .	69	+21	.4	- .7
Meridian.	64	+16	.5	- .5
MO.Columbia	36	+ 6	1.7	+1.3
Kansas City . . .	34	+ 5	.4	+ .1
St. Louis	38	+ 6	2.0	+1.6
Springfield . . .	44	+10	2.8	+2.4
MONT.Billings . . .	6	-18	T	- .1
Glasgow	11	+ 1	.1	0
Great Falls . . .	4	-18	.2	0
Havre	8	- 5	.1	0
Helena.	5	-26	.1	0
Kalispell	9	-12	.3	0
Miles City. . . .	12	- 5	T	- .1
Missoula.	9	-14	T	- .2
NEBR.Grand Island .	22	- 2	T	- .1
Lincoln	24	0	T	- .2
Norfolk	20	0	T	- .1
N.Platte.	24	- 1	T	- .1
Omaha	25	+ 4	T	- .2
Valentine	17	- 4	.1	0
NEV.Ely	21	- 4	.1	0
Las Vegas	43	- 3	T	- .1
Reno.	27	- 7	.6	+ .3
Winnemucca. . . .	25	- 5	T	- .2
N.H.Concord	20	- 1	.6	0
N.J.Atlantic City .	42	+10	.8	0
Trenton	37	+ 5	.4	- .2
N.MEX.Albuquerque .	43	+ 6	.2	+-.1
Roswell	47	+ 7		
N.Y.Albany.	25	+ 4	.3	- .2
Binghamton. . . .	25	+ 3	.3	- .2
Buffalo	29	+ 6	.7	0
New York.	36	+ 4	.5	- .2
Rochester	28	+ 5	.6	0
Syracuse.	28	+ 5	.9	+ .3
N.C.Asheville . . .	52	+14	.3	- .5
Charlotte	53	+10	.3	- .5
Greensboro. . . .	50	+11	.3	- .5
Hatteras.	54	+ 9	.6	- .4
Raleigh	49	+ 8	.3	- .5
Wilmington. . . .	55	+ 8	.2	- .6
N.DAK.Bismarck. . .	9	0	.1	0
Fargo	5	- 1	.3	+ .2
Williston	6	- 3	T	- .1
OHIO.Akron-Canton .	34	+ 8	.9	+ .3
Cincinnati. . . .	40	+ 8	.9	+ .1
Cleveland	34	+ 8	.6	0
Columbus	36	+ 7	.8	+ .2
Dayton.	36	+ 7	1.1	+ .5
Toledo.	33	+ 8	.6	+ .2
Youngstown. . . .	30	+ 5	.8	+ .2
OKLA.Okla. City . .	41	+ 3	1.5	+1.2
Tulsa	43	+ 5	2.3	+1.9
OREG.Astoria. . . .	37	- 5	.8	-1.3
Burns	21	- 6	.4	0
Medford	33	- 5	.3	- .4
Pendleton	29	- 5	.6	+ .3
Portland.	35	- 5	T	-1.2
Salem	34	- 6	.2	-1.2
PA.Allentown. . . .	33	+ 6	.8	+ .2
Erie.	31	+ 7	1.0	+ .5
Harrisburg. . . .	34	+ 3	.5	- .1
Philadelphia. . .	37	+ 5	.2	- .4
Pittsburgh. . . .	35	+ 7	1.6	+1.0
Scranton.	32	+ 6	.4	- .1
R.I. Providence . .	32	+ 4	.3	- .5
S.C. Charleston . .	61	+12	.3	- .4
Columbia.	61	+15	.1	- .7
Greenville. . . .	56	+13	.4	- .6
S.D. Aberdeen . . .	9	- 1	.4	+ .3
Huron	8	- 5	.6	+ .5
Rapid City. . . .	13	-10	.3	+ .2
Sioux Falls . . .	14	- 1	.2	0
TENN.Chattanooga. .	54	+13	1.0	- .3
Knoxville	53	+12	.8	- .3
Memphis	58	+17	3.2	+2.0
Nashville	45	+ 6	.4	- .7
TEX.Abilene	50	+ 5	1.2	+ .9
Amarillo.	42	+ 5	.1	0
Austin.	63	+12	1.9	+1.3
Beaumont.	70	+17	.4	- .6
Brownsville . . .	75	+14	T	- .4
Corpus Christi. .	74	+17	.1	- .4
Del Rio	64	+11	1.8	+1.6
El Paso	52	+ 7	.8	+ .7
Fort Worth. . . .	55	+ 9	2.6	+2.1
Galveston	68	+14	T	- .7
Houston	71	+18	1.4	+ .5
Lubbock	45	+ 5	.9	+ .8
Midland	50	+ 5	.8	+ .7
San Angelo. . . .	54	+ 6	1.2	+1.0
San Antonio . . .	65	+13	2.2	+1.7
Victoria.	71	+17	T	- .5
Waco.	57	+ 9	2.5	+2.0
Wichita Falls . .	47	+ 4	.8	+ .5
UTAH.Blanding . . .	31	+ 1	.1	- .1
Salt Lake City. .	28	- 2	.2	- .1
VT.Burlington . . .	18	+ 2	.3	- .1
VA.Lynchburg. . . .	44	+ 7	.6	0
Norfolk	49	+ 9	.6	- .2
Richmond.	44	+ 6	.3	- .4
Roanoke	41	+ 4	1.0	+ .3
WASH.Colville . . .	19	- 7	.1	- .3
Omak.	17	- 8	.5	+ .2
Quillayute. . . .	34	- 6	.8	-2.4
Seattle-Tacoma. .	35	- 5	.1	-1.1
Spokane	18	-10	.4	- .1
Walla Walla . . .	28	- 8	.2	- .2
Yakima.	25	- 5	.1	- .2
W.Va.Beckley. . . .	41	+ 9	1.6	+ .8
Charleston. . . .	40	+ 5	1.4	+ .6
Huntington. . . .	41	+ 7	1.2	+ .5
Parkersburg . . .	40	+ 7	.7	0
WIS.Green Bay . . .	17	+ 2	.3	+ .1
La Crosse	14	- 2	.4	+ .2
Madison	23	+ 6	.1	- .2
Milwaukee	26	+ 6	.3	0
WYO.Casper.	14	-10	.2	+ .1
Cheyenne.	23	- 4	T	- .1
Lander.	15	- 7	T	- .1
Sheridan.	8	-14	T	- .2
P.R.San Juan. . . .	78	+ 3	.8	+ .1

Based on 1941-70 Normals

STATE SUMMARIES OF WEATHER AND AGRICULTURE

The Bulletin capsulizes nationally important weather and crop conditions. Every Monday SRS publishes more detailed data in State Weekly Weather and Crop Bulletins in cooperation with the National Weather Service, NOAA. Voluntary weather observers, crop reporters, and county extension agents contribute weekly observations for these reports.

ALABAMA: Unseasonably warm through entire week. Temperatures ranged 15 to 25° above normal. High temperatures rose to near record levels 28th and 29th. Cloudy and damp weather with gradual cooling occurred during the weekend. Combined rainfall 1st and 2d averaged over 1.00 in. north but much lighter over the south.

Fieldwork included cutting stalks and turning land. Some cotton picked. Soil tests and fertilization continue. Soil moisture adequate to surplus. Warmer temperatures prompted small grain growth. Some overgrazing. Some potatoes and cool season vegetables being planted. Livestock fair to poor condition. Pastures short, hay becoming short. Marketings below previous week and year.

ARIZONA: Temperatures above normal on 27th and below rest of week. Snowfell northern southeastern areas, no precipitation southern and western Desert Valleys.

Cotton cleanup active. Small grains all stages development. Safflower emergence, stand establishment good. Sugarbeet growth good. Lettuce, broccoli, cabbage harvest southwest. Cabbage, cauliflower, broccoli, carrots harvested Salt River Valley. Oranges, tangelos, mandarins, grapefruit picking Salt River Valley. Harvest lemons, oranges, grapefruit Yuma. Ranges fair, cattle, sheep fair to good. Supplemental feeding necessary. Predator problems in deserts.

ARKANSAS: Warm temperatures beginning of week, cooling trend midweek thru weekend. Temperatures average 7 to 18° above normal. Extremes: 81 and 24°. Precipitation end of week totaling 1.50 to 2.00 in.

Warm, sunny days first of week allowed cotton harvest completion and 1975 crop land preparation. Fescue pastures turned green. Rains end of week saturated soils ending field activity.

CALIFORNIA: Storms brought precipitation, cloudiness, cooling trend early period. No precipitation southeast interior, southern San Joaquin Valley. Light amounts north first of period, heavy 31st with over 2.00 in. coastal mountains. Light amounts south coast 30th. Low temperatures to 20's mid-period Central Valley, into teens low coastal valleys north and central. Cooling trend lowered average temperatures from above average most areas beginning to below all areas end of week.

General rains greatly benefited small grain plantings. Rains slowed or stopped ground preparation. Limited cutting alfalfa continues Imperial Valley. Winter activities continue in orchards, vineyards. Temperatures Lower San Joaquin Valley dropped on nights of January 27th thru 30th, as low as 20°. Durations below 26° varied, up to 9 hours, one station 28th. Moderate damage expected navel orange crop. At least week before damage assessed. Temperatures dipped below 27° for 6 to 8 hours southern areas on 28th and 29th. Minimums not as low as central areas. Wet conditions, frost protection devices held damage to slight amounts. Harvest navel oranges, tangerines, grapefruit, lemons, avocados continue at seasonal levels. Artichokes frosted again. Broccoli good quality, quantity central coast. Cauliflower active, south coast. Carrots active San Joaquin, Imperial Valleys. Celery slowed, poor market, increase expected. Lettuce increased, quality variable. Potato harvest continues Kern County. Rains late week, beneficial range grasses. Rains increased prospects for adequate water. Supplemental feeding general. Lambing, calving continues. Feedlots operate reduced levels. Poults being placed in brooder houses. Bees moved to almonds.

COLORADO: Light snow behind cold front over mountains and eastern plains 27th, low pressure system 28th brought heavy snow mountains, light snow west and northeast. Mountains up to 10 in. snow. Warmer temperatures 29th. Snow in mountains and west 30th, remainder State 31st. Southeast 1 to 2 in. snow. Weekend fair. Temperatures average normal to 8° above normal lower elevations.

Unseasonal warm, dry weather continues. Condition winter wheat fair to poor, major producing areas 6% being pastured. Light to locally moderate wind damage eastern plains. Mild weather helping hold livestock feeding requirements to minimum. Hay supplies below average but expected to be adequate. Soil moisture levels continue critical for winter wheat and ranges.

FLORIDA: Unseasonably warm. Temperatures averaged well above normal. Rainfall generally light or scattered showers occurred mainly early in week.

Soil moisture excessive west, adequate central mostly short south. Land preparation for spring planting underway where conditions favorable. Tobacco plantbeds good. Small grains fair. Sugarcane harvest active, new cane good growth. Pastures very poor to good condition. Cattle and calves mostly fair condition, calving is heavy. Citrus trees and fruit excellent condition, moisture adequate warm temperatures accelerating open bloom. New growth most areas, open bloom vulnerable to frost or freezing. Warm weather continues, rain needed all vegetable areas. Early morning fogs causing some disease problems, but not serious yet. Harvest active all vegetable crops. Supplies continue at seasonal levels. Cabbage, the volume leader with supplies steady. Tomato shipments down slightly, usual seasonal pattern. Snap beans, carrots, radishes about steady. Sweet corn, peppers down slightly. Lettuce, squash increased, strawberries up sharply.

GEORGIA: Temperatures 7 to 12° above normal over State. Precipitation 1.50 to 3.00 in. north, 0.50 in. central and south.

Soil moisture continues excessive. Activity limited by wet weather. Some land preparation, liming and fertilization done. Tobacco bed preparation virtually completed. Condition of small grains good. Pastures poor to good, overgrazed in northern part of State. Cattle fair condition. Condition of tobacco plants good.

HAWAII: Kona storm 30th and 31st. Heavy rains strong, winds, especially Kauai and Oahu.

Flooding on Kauai inundated taro and seed corn

fields. Fruit and vegetable plantings heavily damaged. Damage to leafy crops heavy on Oahu. Excessive moisture slowing farm operations all Islands. Vegetable supplies becoming light. Banana supplies adequate. Papaya supplies light. Pastures soggy, some low-lying areas on Kauai and Oahu. Sugar and pineapple operations continue slack.

IDAHO: Precipitation was above normal north and below normal south. Precipitation ranged from a trace at Buhl to over 1.50 in. at Grangeville. A cooling trend through the period with temperatures averaging below normal for the week at nearly all stations. Temperature extremes ranged from a high of 62° at Mountain Home to a low of 23° below at Salmon.

Outdoor activities slowed by cooler weather and light snows. Supplemental feeding requirements increased. Lambing well underway. Calving increasing. Marketings slowed by weather and poor market conditions.

ILLINOIS: Temperatures 6 to 11° above normal. Precipitation light to moderate north, ranging from under 0.10 in. to 0.50 in. Rain south 1.50 to 2.00 in. Snow 29th, 1 in. west.

INDIANA: Mild and cloudy. Temperatures ranged from 22 to 73° and averaged 10° above normal. Precipitation 0.50 in. north, 1.40 in. central and south.

No snow cover. Soils frozen to 6 in. north, 0 in south. Soils continue to be soft, limiting significant progress in completion of corn and soybean harvest. Major activities include going to sales, computing taxes, repairing equipment, and chores.

IOWA: Temperatures near or slightly below normal northwest, 6 to 7° above normal south, east central. Extreme north with heavy snow cover. Precipitation near to slightly below normal, 1 to 3 in. snow northwest 28th, 1 to 2 in. extreme southeast 30th.

KANSAS: Temperature averages ranged from near normal northwest and north central to 6° above normal southeast. Precipitation ranged from 0.33 in. northeast to more than 3.00 in. southeast. No significant moisture western two-thirds.

Wheat condition variable. Very good south central and east. Subject to blowing west and north central. Topsoil very dry. Ground cover sparse. Light damage from blowing in west.

KENTUCKY: Temperatures averaged a little above normal with low's in the 20's at beginning of week. Record highs around 70 at mid-period. Rain fell somewhere in the State every day 29th thru 2d. Totals generally 1.00 to 1.50 in.

Soft, wet soil limiting field activities, causing sloppy conditions underfoot around barns and feedlots. Most jobs revolve around livestock care and feeding. Only two burley tobacco markets remain open, marketing season about finished.

LOUISIANA: Exceptionally warm. Average temperatures 11 to 18° above normal. Extensive fog most days. Cooler with locally heavy rains north, weekend. Several daily high temperature records set. Extremes: 88° Curtis 30th and 45° Shreveport on 3d. Rains totaled 2.00 to locally 4.00 in. extreme northwest. Only few hundredths or traces most other areas. Greatest 1-day rain, 1.42 in., at Shreveport morning of 3d.

Agricultural activities confined to routine chores.

MARYLAND AND DELAWARE: Warm week, 7 to 10° above normal. Highs mid-50's to mid-70's. Lows mid-20's to low-30's. Precipitation ranged 0.32 to 1.49 in. Some snow. Weekend cooler, light rain and snow.

Fields generally too wet for machine work. Tobacco seed bed preparation started. Orchard pruning active. Winter grains generally good but ground cover light late seeded fields.

MICHIGAN: Temperatures in the Lower Peninsula ranged from 4 to 8° above normal south to 2 to 4° above north. Upper Peninsula temperatures ranged 0 to 4° below normal. Precipitation, as light snow, fell early in week totaling up to 0.70 in. throughout.

Farm work mainly caring for livestock and readying equipment for spring.

MINNESOTA: Temperatures averaged 2° below normal southwest to 6° below normal northeast. Precipitation averaged a little above normal most sections with 3 to 6 in. new snow common. Snow cover at week's end 30 to 35 in. northeast quarter; 20 to 29 in. central through north; 9 to 19 in. southern and western extremes.

Moderate storm passing eastward across northern Iowa 28th and 29th produced 4 to 8 in. snow central and south areas. Farm work consisted mostly of digging out after severe winter storm earlier in month and getting back to normal care and management livestock and poultry.

MISSISSIPPI: Small amount of rain fell first of week. Temperatures averaged 12° above normal. Extremes: 29 and 83°. The greatest 24-hour rainfall was 3.42 in. at Tylertown.

Soil moisture adequate to surplus. 2.1 days suitable fieldwork: Condition of wheat, oats and livestock mostly fair. Hay and roughage supplies short to adequate. Feed grain supplies mostly short.

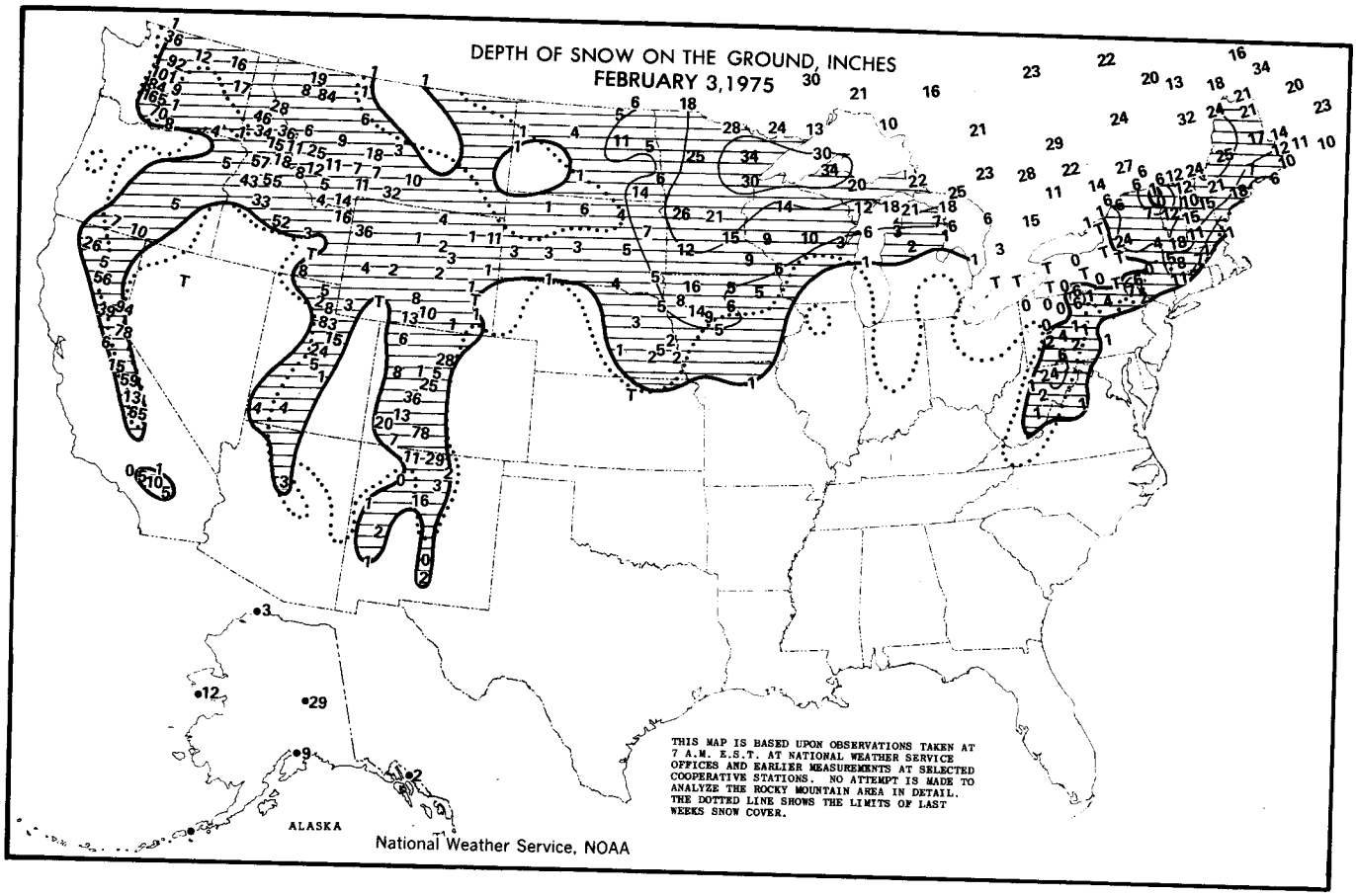
MISSOURI: Heavy and frequent rainfall produced marked rises in many streams across the south and east. Total rainfall in excess of 2.00 in. and many areas and a few 3.00 in. or more. Temperatures averaged 10 to 13° above normal with readings on the 28th and 29th rising into the upper 50's and 60's across southern sections approaching record highs for those dates. Temperatures north were appreciably cooler, averaging a few degrees above normal, with some precipitation in these areas recorded as freezing rain or snow.

MONTANA: Cold temperatures, near normal northeast, but well below normal elsewhere. Lowest minimum temperatures 20 to 40° below southwest. Not so cold elsewhere but still subzero minimums. Moderating temperatures end of week southwest brought temperatures there back in 30's. Heavy snow and blizzard conditions northwest on the 2d.

Snowcover protection to winter wheat good except most of eastern third. Winter wheat fair to good. Livestock good condition, shrinkage normal. Grazing closed except eastern districts. Virtually all livestock receiving supplemental feed.

NEBRASKA: Cool daytime temperatures, mostly above normal night temperatures. Mean ranged near to 6° below normal. Light snow several days, only traces to few tenths precipitation.

Winter wheat condition poor to good. Central and western mostly poor to fair, moisture short. Some areas wheat showing signs of wind damage. Eastern districts wheat fair to good, snow cover most areas. Winter rye mostly poor to fair condition. Range and pasture supplies below average. Supplemental feeding necessary. One-half counties



report average feed and forage supplies, remainder below average supplies. Livestock losses from January 10 blizzard negligible.

NEVADA: Major storm hit Sierras with 3 to 4 feet snow. Otherwise typical midwinter weather. Temperature ranged from -8° Owyhee to 57° Las Vegas.

Livestock wintering well. Supplemental feeding necessary.

NEW ENGLAND: Generally fair except storm on 29th, 6 to 8 in. snow north Maine, rain southern New England. Temperatures generally near to above normal except north Maine. Minus 28° Houlton, Maine on 31st a.m.

NEW JERSEY: Temperatures 2 to 3° above normal, weekly averages: 31° north, 35° south and 36° coastal divisions. Extremes: 15° at Long Valley and 68° at Pamona. Precipitation averaged 0.51 in. north, 0.46 in. south and 0.29 in. coastal divisions. Light snowfall in various sections of State on 30th to February 1. Heaviest fall 1 in. at Glassboro.

NEW MEXICO: Week was warm and wet with every section receiving some rain or snow. Heaviest amounts were in the south and mostly ranged from 0.75 in. upward to well more than 1.00 in. Cloudiness was persistent and precipitation recurring from 29th through weekend. Temperatures for the week averaged from 5 to 10° warmer than normal.

Moisture, adequate. High winds caused slight small grain damage, northeast. Rain, warmer days promoted good growth conditions, south. Winter wheat, barley fair with grazing active. Livestock fair to good. Supplemental feeding active. Ranges short.

NEW YORK: Temperatures averaged above normal. Precipitation averaged 0.75 in. west and 0.33 in. east. Highlight of week occurred on 29th as low pressure moved eastward from Great Lakes. Freezing rain fell southeastern sections and mixed precipitation northeast. Rain, thunderstorms and rapidly warming temperatures prevailed west. Very strong winds followed the storm with gusts over 60 mph causing some damage central. Extremes: 58° Rochester, 29th and -22° Saranac Lake on 1st.

NORTH CAROLINA: Temperatures averaged 12 to 14° above normal with record breaking January temperatures over south on 31st. Precipitation totaled 1.00 to 2.00 in., with lesser amounts on the coast.

Fieldwork: 3.0 days suitable. Soil moisture surplus to adequate. Small grains mostly fair to good. Pastures fair to good, supplemental feeding continues. Feed grains and roughage 95% adequate, 5% short. Gasing tobacco plantbeds and routine maintenance. Fields too wet for preparation. Labor surplus to adequate.

NORTH DAKOTA: Temperatures within 3° of normal all divisions. South central furthest above normal at 3°, north central below normal at 2°. Extremes: 40° at Pretty Rock, -27° at Upham. Precipitation averaged above normal east and below normal west. Greatest weekly and 24-hour precipitation at Wampeton with 0.76 in. and 0.56 in., respectively. Snow cover almost non-existent southwest and west central to 14 in. southeast. Weekend fair days and cool to cold nights with snow showers.

Snowy conditions east created work in snow removal, but no storms injurious to livestock. Grazing possible in areas void of snow, but little feed available. Farmers marketing crops and livestock, doing farm accounts and lining up seed and other supplies for spring.

OHIO: Temperatures above normal. Highs in 50's and 60's on 28th and 29th. Record high at several locations on 29th, highest was 68° at Zanesville. High wind warning east on 29th and wind gusts of 50 mph or higher in many areas. Locally heavy rains of 1.00 in. in some locations on 29th. Snowfall of around 1 in. central on 31st. Light snow or flurries north and light rain or freezing rain central and south on 1st. Clearing on 2d.

Ground too wet and soft in most areas for field activity. Some plowing and lime being spread central where conditions permit.

OKLAHOMA: Temperatures averaged up to 15° above normal. Precipitation averages ranged from 0.10 in. Panhandle to 2.10 in. northeast. Weekend cool and wet.

Rains last half of week halted fieldwork. Some cotton, soybeans harvested and ground preparation for spring planted small grains early in week. Most wheat good condition and making some growth. Some spraying for aphids and top dressing. Heavy supplemental feeding livestock. Ranges fair to poor. Muddy fields limiting wheat grazing.

OREGON: Temperatures ranged 3 to 5° below normal west and 5 to 8° below normal east. Highs 61° west, lows -10°east. Precipitation ranged 1.00 to 3.00 in. along coast and Willamette Valley, 0.50 in. southwestern valleys, 1.00 to 2.00 in. northeast and 0.10 in. southeast.

Growers attending annual agricultural meetings. Winter farm activities continuing, pruning orchards, training berries, spraying grains. Potatoes, onions moving slowly from storage. Feeding livestock, normal to heavy rates. Feed supplies adequate, expensive. Lambing continuing, some calving, west.

PENNSYLVANIA: Above normal and mildest week since mid-January. Extremes: 64° southeast to 4° north central. Precipitation every day, but 2d totaled from 0.25 in. extreme southeast to 1.50 in. southwest, elsewhere 0.50 to 1.00 in. snowfall traces northern to 8 in. southwest mountains.

Farmers doing routine winter chores.

PUERTO RICO: Island average rainfall 1.26 in. Highest weekly total 10.97 in. at Pico Del Esteluquillo. Highest 24-hour total 6.50 in. at Pico Del EsteluquilIo. Well distributed rains Islandwide except south coastal areas where very little rain occurred. Temperatures averaged about 75° on coasts and 69° interior. Extremes: 92 and 52°.

Dry weather south coast favored sugarcane maturity, but was delayed by excessive humidity some northern sections. Favorable weather for harvesting operations. In coffee zones, good weather for pruning fertilizing, cultivating, and drying operations. Tobacco plantings developing well but excessive humidity some areas delaying harvest and drying in sheds. In Barranquitas, plants being affected by worms. Development of pastures delayed by lack of rainfall south and excessive humidity west. New plantings and harvest of good variety of food crops east and west interior.

SOUTH CAROLINA: Temperatures averaged 12 to 17° above normal depending on area. New high temperature records set at Columbia on 29th with 82°, 30th with 81°, record tied on 31st with 84°. Rainfall below normal, amounts varying from a trace to 0.15 in.

Considerable variations soil moisture conditions. Harvest cabbage, mixed greens increased coastal areas. Peach tree pruning active. Apple tree pruning nearing completion. Applying dormant sprays to orchards and setting apple and peach tree stock. Some tobacco beds still being seeded. Planting pine trees, preparing land when conditions allow.

SOUTH DAKOTA: Temperatures average below to near normal. Extremes: 36° Chamberlain 27th, -22° Conde 31st. Several snowfalls which varied from 2 to 6 in. Precipitation slightly above average, but soil moisture is short.

Main farm activities are livestock care and farm machinery maintenance.

TENNESSEE: Heavy rain in west and middle portions and moderate in the east during midweek, some amounts over 2.00 in. Week began with much above normal temperatures and overall weekly average nearly 15° above normal.

No field work done because of wet conditions. Main farm activity feeding livestock and repairing buildings and machinery. Small grains in good condition. Cattle in fair condition.

TEXAS: Cold front triggered moderate to heavy rain early in week. Rainfall north central, northeast 2.00 to 5.00 in. South Plains, Edwards Plateau excess of 1.00 in. Warm temperatures preceded front slightly above normal in Panhandle, far west to 15° above normal in south central. Cotton harvest nearing completion with few fields remaining in Low Plains, Cross Timbers, Blacklands. Cotton harvest 99% complete, equals last year's pace and the average 97%. Wheat, oats showed new growth; but, new growth quickly disappeared from overgrazing. High Plains: Livestock good to excellent gains first two months of grazing season, but heavy movement of wheat recently. Lower Rio Grande Valley: Cabbage, carrot, lettuce harvest active. Onions continue to make good growth. Cantaloup and honeydew melon planting underway. Coastal Bend: Melon planting started. San Antonio-Winter Garden: Cabbage, carrot harvest continues. Spinach continues to make good growth. Watermelon land prepared, ready to plant. Laredo: Onions showing fair growth. Knox-Haskell: Land preparation progressed for planting of potato crop. Trans-Pecos: Land preparation active for planting of Pecos canteloup crop. High Plains: Land preparation continues for planting of summer vegetables. Citrus harvest continued active. Wheat, oats good growth High Plains to Coastal Bend. Grazing improved many areas, but overgrazing common most localities. Livestock losses from malnutrition increasing in East, Blacklands. Livestock fair condition for time of year, but effects of overgrazing apparent.

UTAH: Recurring periods light rain or snow most sections of State during past week. Average temperatures ranged from near normal to 10° above.

Farm flock lambing should start this week. Care and feeding cattle and sheep on winter range lands, valley farms, in feedlots, dairy herds, and poultry flocks continue major activities. Turkey poults for 1975 flocks now being delivered.

Some marketing potatoes, apples, dry onions from storage continues, potatoes going mostly for chipping.

VIRGINIA: Warming trend returning to colder end of period. Temperatures average 10° above normal. Record breaking highs midweek. Extremes: Low 20's to high 70's.
Light precipitation occurring as rain, snow end week. Fieldwork: 2.1 days suitable. Topsoil moisture: 54% adequate, 46% surplus. Livestock condition good to excellent. Feed grains, hay, roughage supplies adequate except few areas southwest. Feeding and care for livestock principal activity. Land preparation, spreading fertilizer, lime, top dressing small grains progressed when land suitable. Preparing and seeding tobacco plantbeds under way.

WASHINGTON: West: Average temperatures 2 to 5° subnormal. Extremes: 40's, 20's. Showers of mixed rain and snow. Total precipitation amounts from 0.02 in. to over 1.00 in.
Most farm activities slowed by weather. Harvesting forced rhubarb. Pruning raspberries and blueberries. Colder weather increased consumption of hay and silage but local supplies adequate. East: Average readings 2 to 6° subnormal. Extremes: 30's, teens and lower. Snowfall depths on ground from a trace to 12 in. Total precipitation ranged from 0.04 in. to over 1.00 in., mostly southern half.
Pruning in orchards slowed by weather. Winter hardiness of trees continued to improve. Grape pruning and trellis repair on grapes and hops progressing well. Other activities include fertilizer spreading and equipment maintenance. Snow increased protective cover on wheat fields. Rain some areas added to below normal soil moisture levels. Livestock in good condition. Hay supplies adequate. Lambing increased. Early calving continued.

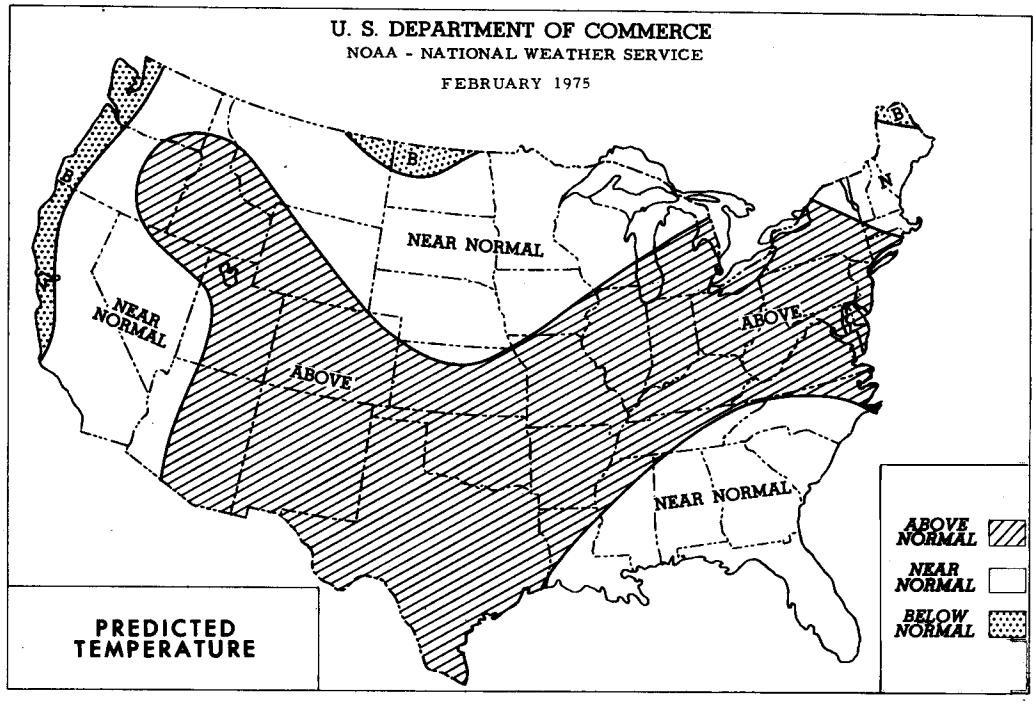
WEST VIRGINIA: Temperatures averaged above normal. Central section highest at 10° above normal. Precipitation near to slightly above normal.
Soil moisture mostly surplus to adequate. Fieldwork: 2.9 days suitable. Farm activities limited to feeding livestock and repairs. Feeding areas muddy, difficult to move feed and equipment.

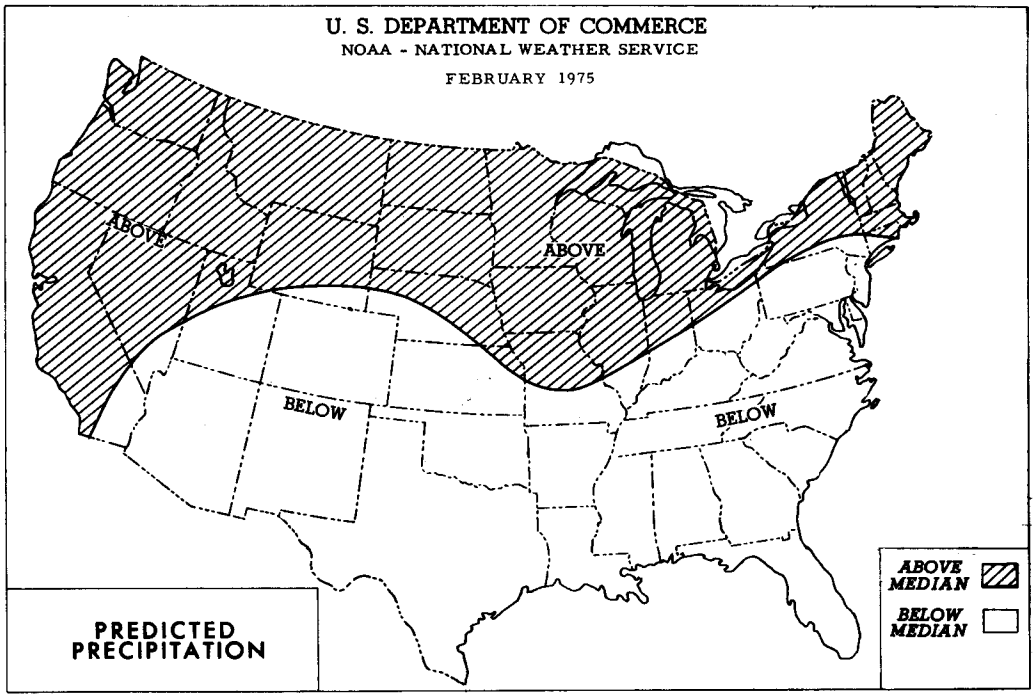
WISCONSIN: Heavy snow of 4 to 8 in. central and northern areas 28th and 29th. Thunderstorms and freezing rain southeast. Variable clouds remainder of week with occasional snow flurries. Low temperatures ranged from -20° north central to 15° in south. Highs ranged from 15° north to mid 30's south.
Frost and snow depths increased past two weeks. Frost depths averaged about 17 in., an increase of 6.5 in. from two weeks earlier and the deepest for late January since 1968. Snow depths averaged about 8 in., an increase of 3.5 in. from two weeks ago.

WYOMING: Temperatures generally below normal. Several locations southwest few degrees above normal but most locations 6 to 10° below. Many locations warmed into upper 40's. Precipitation wide spread most locations more than normal. Amounts ranged from a few hundredths to over 0.50 in.
Supplemental feeding livestock major activity. Livestock condition good, no unusual death loss. Preparing for calving and lambing. Moisture needed badly, especially winter wheat southeast.

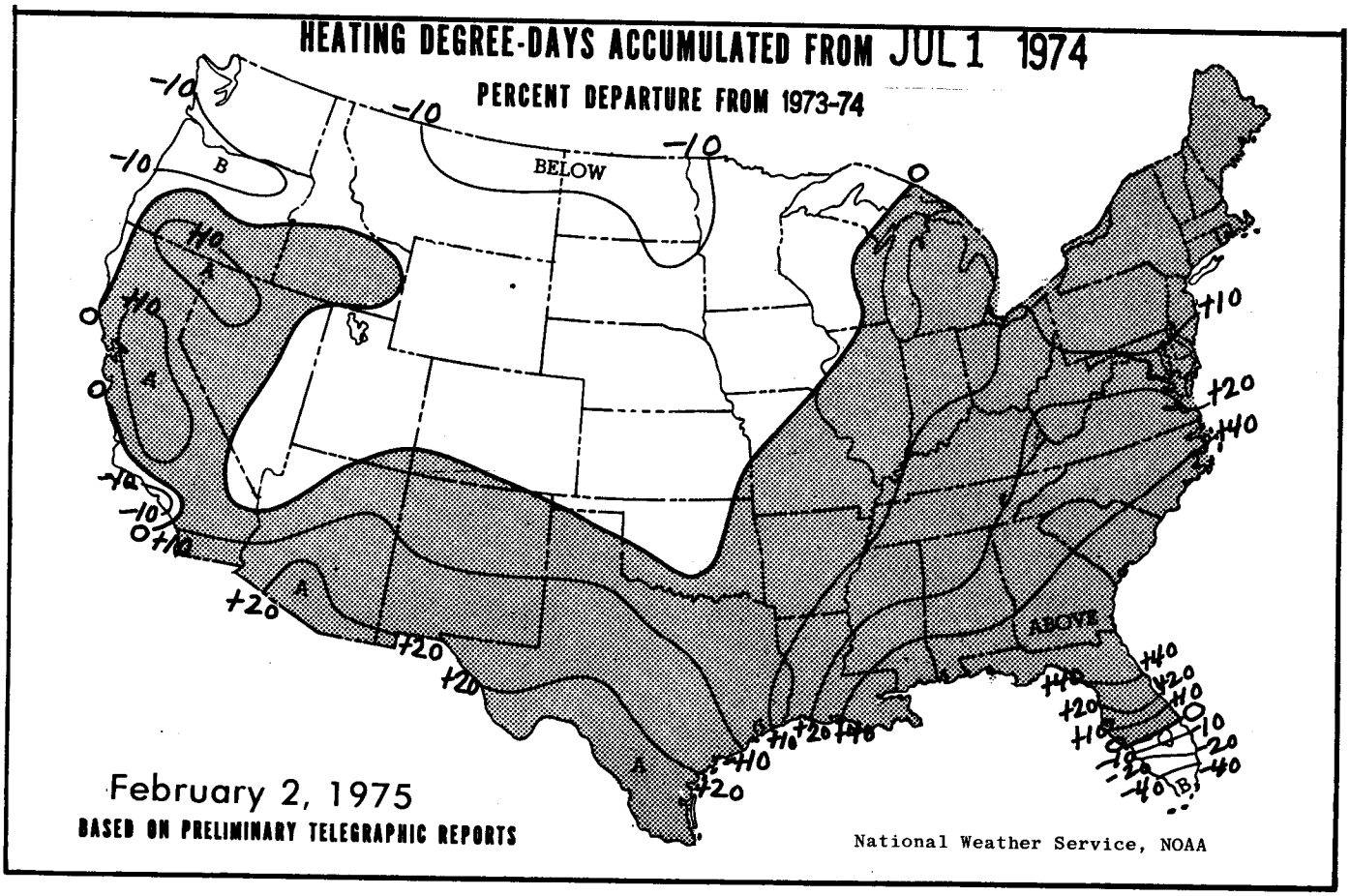
Standard copy for the weekly Weather and Crop Bulletin is prepared by: Richard E. Felch, Lyle M. Denny, Orus W. Byrd, National Weather Service, NOAA; DeLon Brown, Nancy J. Burt, Statistical Reporting Service, USDA.

AVERAGE MONTHLY WEATHER OUTLOOK





These prognostic charts show the expected categories of average temperature and total precipitation for the period indicated. They are taken from the Weather Service's publication Average Monthly Weather Outlook which contains additional information necessary for complete interpretation.



THE HEATING DEGREE-DAY STATISTIC

The heating degree-day statistic is a simple but excellent indicator of the demand for heating fuel in area based on average temperature. Heating engineers developed this useful integrator early in the century. The procedure neglects such factors as solar radiation and wind, but it still a useful tool for planners and heating fuel companies.

The fuel industry has adopted this procedure for monitoring fuel consumption and anticipating fuel needs. Supply levels can be monitored by simply keeping up-to-date on the heating degree-day accumulations. Forecasts can be converted into heating degree-day statistics and used to determine future fuel demands. The high cost of storing oil and gas puts a premium on precise evaluation of fuel use rates and peak demands, and on the efficient scheduling of deliveries. This is of particular importance when the total supply picture is tight.

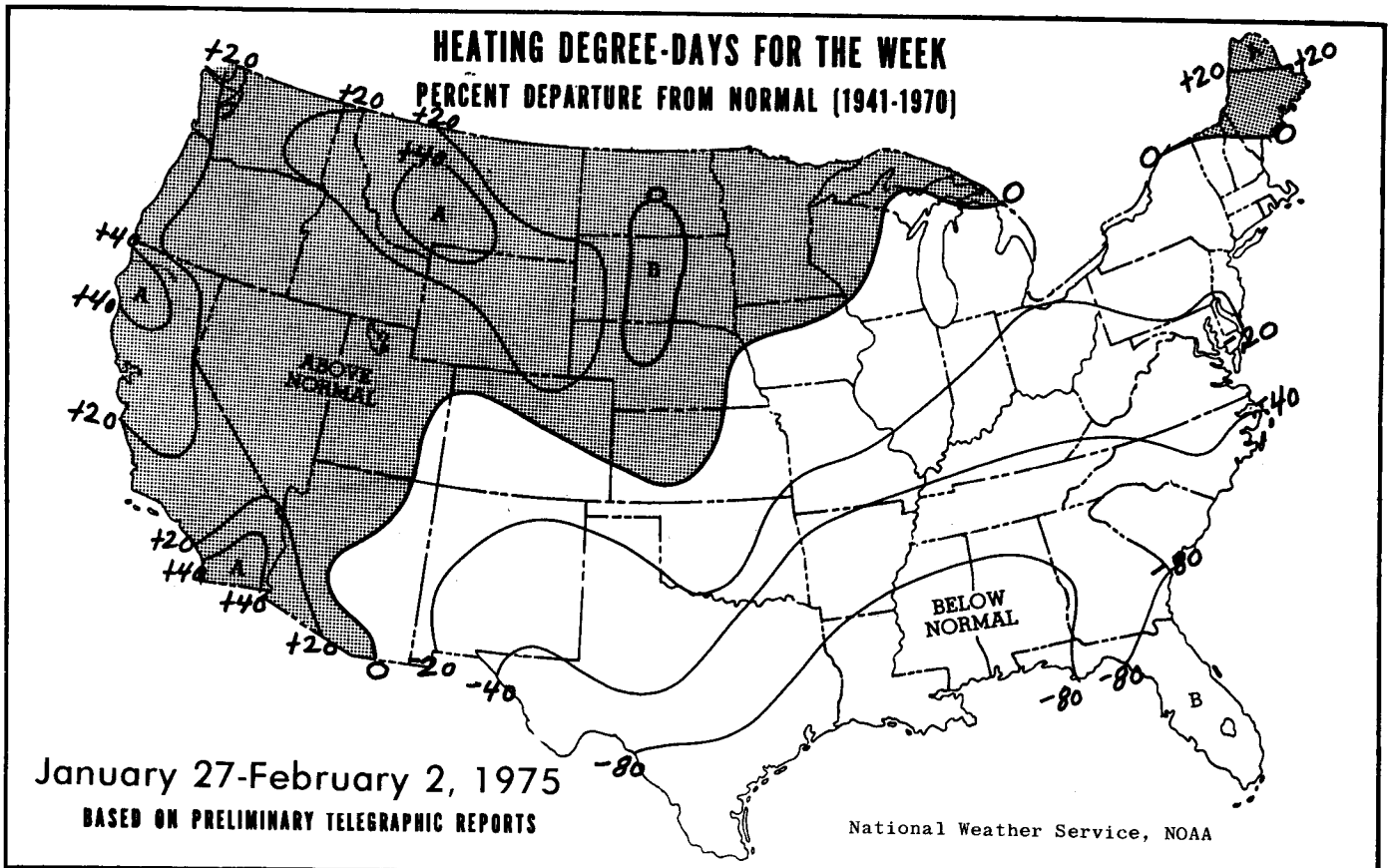
The degree-day statistic is based on the fact that when the daily mean an temperature is 65° or higher, most buildings require no heat to maintain an inside temperature of at least 70°. It is computed as follows:

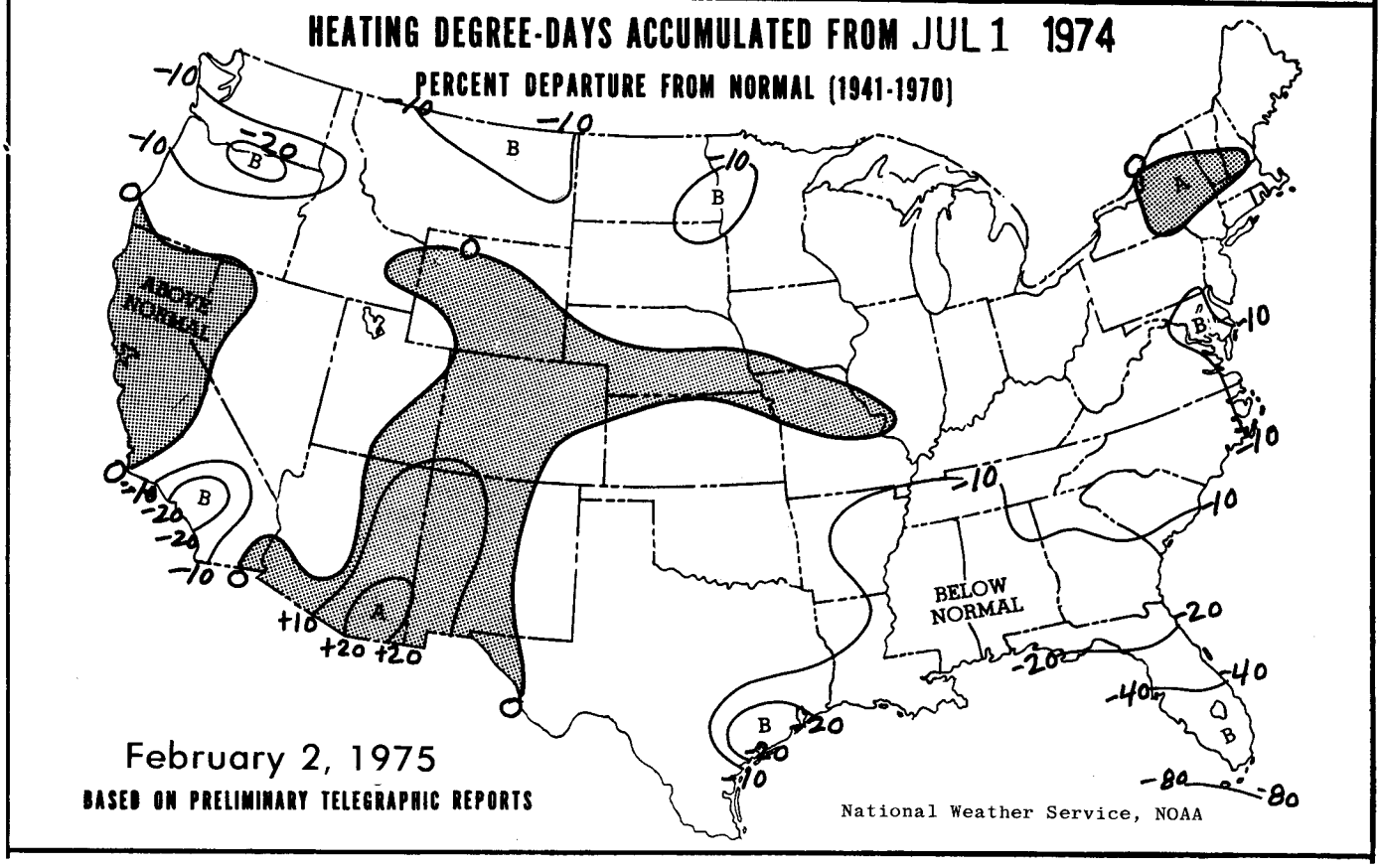
$$65° - \frac{\text{Max Temp} + \text{Min Temp}}{2.0} = \text{Daily Heating Degree-Days}$$

Thus, each degree of mean temperature below 65° is one degree-day unit. If the mean temperature is 45°, 20 heating degree-day would be accumulated. If the daily mean temperature were 25°, 40 degree-day units were accumulated. Twice as much fuel would be required on a day with 40 heating degree-days than a day with 20 heating degree-days. If the mean temperature is greater than 65°, the heating degree-day value is set equal to zero (0) for the day. The degree-days for any given period are obtained by totaling the degree-days for each day of the period.

As the maps are presented, a positive departure indicates that the heating degree-day accumulation is greater than the comparative value, so temperatures have been colder than anticipated and thus fuel consumption is greater than expected. Similarly, a negative departure indicates that conditions have been warmer than anticipated. Note the similarity in the weekly percent of normal departure and the temperature departure map on page 2.

Because of mild weather during much of January in many parts of the United States, most of the Nation east of the Rockies is now warmer than normal for this heating season. However, the eastern half of the Country has been colder than last year. The past week has been one of great extremes in the Southeast and Northwest.


HEATING DEGREE-DAYS FOR THE WEEK
PERCENT DEPARTURE FROM NORMAL (1941-1970)
ABOVE NORMAL
BELOW NORMAL
January 27-February 2, 1975
BASED ON PRELIMINARY TELEGRAPHIC REPORTS
National Weather Service, NOAA


HEATING DEGREE-DAYS ACCUMULATED FROM JUL 1 1974
PERCENT DEPARTURE FROM NORMAL (1941-1970)
ABOVE NORMAL
BELOW NORMAL
February 2, 1975
BASED ON PRELIMINARY TELEGRAPHIC REPORTS
National Weather Service, NOAA

Heating Degree Days (Base 65°) For Week Ending Feb. 2, 1975

States and Stations	Weekly TOTAL	Weekly Departure*	Seasonal † Accumulation TOTAL	Seasonal † Accumulation Departure*	Seasonal † Accumulation Departure From 1973-74
ALA.Birmingham	16	-127	1600	-242	241
Mobile	0	- 98	930	-184	336
Montgomery	7	-115	1273	-228	289
ARIZ.Flagstaff	267	13	4022	- 83	236
Phoenix	83	- 6	990	- 49	192
Tucson	98	4	1323	229	218
Winslow	186	- 23	3321	367	363
Yuma	86	23	739	29	80
ARK.Fort Smith	83	- 89	2151	- 5	122
Little Rock	62	-109	1840	-313	130
CALIF.Bakersfield	119	10	1400	- 34	217
Eureka	170	51	2615	26	- 21
Fresno	159	35	1729	54	180
Los Angeles	70	0	632	-288	-100
Red Bluff	176	52	1795	149	109
San Diego	96	28	675	-119	75
San Francisco	140	30	1751	58	1
Stockton	161	30	1848	128	308
COLO.Denver	245	5	3520	64	- 92
Grand Junction	235	- 18	3655	154	- 50
Pueblo	220	- 14	3256	0	- 36
CONN.Bridgeport	216	- 29	2817	-172	213
Hartford	230	- 50	3561	-119	299
DEL.Wilmington	189	- 42	2702	-191	255
D.C.Washington	153	- 50	2196	-343	262
FLA.Apalachicola	21	- 57	679	-209	221
Daytona Beach	5	- 51	378	-188	114
Ft. Myers	0	- 34	118	-176	- 41
Jacksonville	8	- 69	763	-104	267
Key West	0	- 7	7	- 28	- 17
Lakeland	0	- 46	268	-162	45
Miami	0	- 14	48	- 78	- 46
Orlando	1	- 48	277	-165	65
Tallahassee	20	- 71	1045	0	457
Tampa	2	- 47	261	-196	31
W. Palm Beach	0	- 21	89	-100	- 17
GA.Atlanta	38	-116	1753	-212	365
Augusta	54	- 78	1700	37	522
Macon	28	- 91	1313	-168	394
Savannah	13	- 92	1009	-275	267
IDAHO.Boise	239	3	3313	-190	153
Lewiston	255	36	2932	-398	-258
Pocatello	329	51	4177	16	101
ILL.Cairo	126	- 70	2333	- 85	138
Chicago	233	- 48	3485	-108	33
Moline	250	- 49	3704	-127	- 57
Peoria	230	- 53	3573	- 89	- 6
Rockford	258	- 52	3912	-149	90
Springfield	202	- 61	3220	-142	19
IND.Evansville	144	- 78	2719	-141	253
Fort Wayne	227	- 47	3548	- 98	128
Indianapolis	200	- 58	3286	- 63	364
South Bend	223	- 64	3325	-429	102
IOWA.Burlington	247	- 42	3601	- 99	0
Des Moines	268	- 44	3750	-265	- 62
Dubuque	280	- 45	4218	-109	46
Sioux City	319	0	4087	-109	13
KANS.Concordia	263	3	3223	-179	-321
Dodge City	227	1	2923	-135	-230
Goodland	254	2	3599	- 3	-153
Topeka	216	- 32	3102	-121	-218
Wichita	205	- 21	2800	-103	-280
KY.Lexington	158	- 66	2783	- 89	441
Louisville	154	- 63	2653	-179	384
LA.Baton Rouge	0	- 98	932	-190	265
Lake Charles	0	- 91	852	-140	133
New Orleans	0	- 89	829	-144	259
Shreveport	22	- 97	1394	- 30	96
MAINE.Caribou	483	103	5559	54	160
Portland	297	- 11	3971	-251	87
MD.Baltimore	171	- 50	2502	-307	- 5
MASS.Boston	233	- 19	2988	-165	149
MICH.Alpena	324	- 12	4497	-254	71
Detroit	235	- 45	3736	25	253
Flint	241	- 60	3797	-228	121
Grand Rapids	263	- 31	4106	213	400
Houghton Lake	309	- 27	4531	-213	122
Lansing	251	- 50	3929	- 37	141
Marquette	321	- 8	4432	-194	- 54
Muskegon	256	- 38	3766	-105	32
S. Ste. Marie	383	23	5126	- 4	96
MINN.Duluth	442	49	5701	71	- 33
Internatl Falls	478	41	5851	-386	-204
Minneapolis	375	7	4648	-280	- 53
Rochester	364	3	4747	- 97	11
St. Cloud	416	26	5214	- 32	53
MISS.Jackson	4	-121	1292	-208	240
Meridian	10	-115	1327	-255	373
MO.Columbia	200	- 42	3196	101	107
Kansas City	221	- 28	3195	39	- 27
St. Louis	190	- 39	2990	80	22
Springfield	146	- 70	2784	- 27	189
MONT.Billings	416	127	4093	-120	- 71
Glasgow	382	0	4575	-713	-813
Great Falls	430	132	4068	-345	-467
Havre	391	30	4452	-789	-730
Helena	490	179	4606	-232	-233
Kalispell	389	81	4741	-333	30
Miles City	371	34	4227	-466	-321
Missoula	387	93	4336	-405	-118
NEBR.Grand Island	296	7	3913	56	-224
Lincoln	288	- 1	3806	37	-293
Norfolk	314	0	4027	-147	-186
North Platte	289	8	4118	106	-273
Omaha	277	- 11	3729	59	-172
Valentine	334	29	4056	-226	-212
NEV.Ely	309	29	4360	- 74	-108
Las Vegas	155	21	1639	- 89	- 99
Reno	254	38	3525	9	242
Winnemucca	277	35	3891	13	401
N.H.Concord	316	6	4451	201	252
N.J.Atlantic City	192	- 37	2752	-107	308
Trenton	195	- 36	2646	-225	124
N.MEX.Albuquerque	152	- 44	2991	279	121
Roswell	126	- 51	2364	- 72	296
N.Y.Albany	277	- 31	4087	82	183
Binghamton	281	- 20	4179	39	464
Buffalo	250	- 44	3589	-280	- 12
New York	200	- 31	2623	-159	187
Rochester	256	- 37	3712	- 76	276
Syracuse	256	- 38	3764	- 4	130
N.C.Asheville	90	- 99	2408	-181	406
Hatteras	75	- 65	1366	-174	394
Charlotte	80	- 74	2069	35	384
Greensboro	104	- 78	2215	-173	142
Raleigh	111	- 57	2187	- 7	547
Wilmington	70	- 58	1428	-105	481
N.Dak.Bismarck	387	- 4	5327	- 27	-484
Fargo	422	12	4849	-641	-937
Williston	406	17	5100	-342	-633
OHIO.Akron-Canton	213	- 60	3356	-247	314
Cleveland	215	- 55	3383	-134	424
Columbus	203	- 49	3129	-266	280
Cincinnati	175	- 58	3082	44	338
Dayton	200	- 54	3189	-157	224
Toledo	223	- 57	3684	- 47	134
Youngstown	226	- 54	3610	- 87	302
OKLA.Okla City	165	- 22	2213	-122	- 27
Tulsa	150	- 39	2244	- 91	- 30
OREG.Astoria	197	34	2628	-310	-465
Burns	307	43	4026	-181	- 11
Medford	222	36	2714	-190	241
Pendleton	249	34	2518	-681	-461
Portland	210	33	2296	-501	-255
Salem	217	45	2454	-329	-342
PA.Allentown	223	- 41	3249	-157	266
Erie	241	- 46	3672	-130	353
Harrisburg	215	- 25	3070	- 64	383
Philadelphia	163	- 68	2565	-290	76
Pittsburgh	207	- 52	3202	-297	240
Scranton	227	- 46	3357	-307	-124
R.I.Providence	231	- 28	3186	-166	168
S.C.Charleston	34	- 78	1242	-143	483
Columbia	39	- 94	1483	-205	537
Greenville	60	- 94	1991	- 16	323
S.DAK.Aberdeen	388	5	4601	-535	-793
Huron	396	35	4500	-301	-319
Rapid City	362	68	4027	-169	-256
Sioux Falls	357	9	4471	-212	-184
TENN.Chattanooga	77	- 91	2249	20	509
Knoxville	80	- 88	2075	-117	323
Memphis	55	-110	1751	-318	153
Nashville	82	-100	2092	-239	311
TEX.Abilene	98	- 42	1756	55	202
Amarillo	140	- 55	2535	- 28	128
Austin	30	- 73	1081	- 73	107
Brownsville	0	- 49	405	- 21	69
Corpus Christi	0	- 64	606	- 23	118
Del Rio	19	- 72	1032	- 54	222
El Paso	86	- 52	1949	115	252
Fort Worth	66	- 68	1389	-152	- 7
Galveston	0	- 80	572	-194	48
Houston	0	- 88	752	-200	- 24
Lubbock	132	- 44	2237	- 6	306
Midland	92	- 49	1615	-117	78
Beaumont	0	- 90	883	-123	115
San Angelo	74	- 48	1479	- 21	231
San Antonio	16	- 79	1090	29	172
Victoria	8	- 74	654	-163	64
Waco	46	- 73	1361	7	146
Wichita Falls	126	- 29	1787	- 92	91
UTAH.Salt Lake C	260	14	3244	-337	-172
VT.Burlington	326	- 17	4262	-246	- 31
VA.Lynchburg	147	- 49	2587	1	412
Norfolk	115	- 60	1818	-248	272
Richmond	145	- 44	2408	- 9	460
Roanoke	132	- 64	2573	- 42	441
WASH.Quillayute	216	39	3252	- 74	-306
Seattle-Tacoma	209	31	2717	-265	- 82
Spokane	327	66	3979	-120	- 58
Walla Walla	256	48	2618	-386	-238
Yakima	279	36	3352	-387	-224
W.VA.Beckley	168	- 63	3246	- 88	556
Charleston	174	- 36	2917	117	624
Huntington	170	- 40	2771	- 36	498
Parkersburg	173	- 51	2934	34	444
WIS.Green Bay	337	- 12	4600	- 88	174
LaCrosse	356	15	4281	-130	57
Madison	292	- 43	4151	-383	-112
Milwaukee	269	- 46	3942	-313	59
WYO.Casper	359	74	4490	183	29
Cheyenne	325	62	4266	199	66
Lander	352	48	4626	14	23
Sheridan	397	99	4430	- 28	-124

* Based on 1941-70 Normals. † Accumulation July 1, 1974

WEATHER AND THE SCREWWORM

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BACKGROUND

Screwworm flies (Cochliomyia hominivorax, Coquerel) are injurious parasites of domestic animals and wildlife. The destructive larva of the screwworm fly develops from eggs which are laid in animal wounds. Tick bites, the wounds left from castration and dehorning, and the navals of newborn animals are common points of infestation. An adult female screwworm fly may lay as many as 300 eggs in a single wound. The resulting larvae grow by feeding on the animal's flesh head-down and tightly packed in the wound. The larvae move in place with a cork-screw motion, hence the name screwworm. Left untreated, crippling or death of the animal is inevitable. Before effective controls, domestic livestock losses were estimated to be $20 million annually in the southeastern United States and $50 to $100 million in the Southwest.

In 1955, researchers of the U.S. Department of Agriculture showed that careful irradiation of the pupal stage of the fly produces sexual sterility. However, the flies continue to mature normally and demonstrate the same types of activity as those of wild-type flies. It had been noted by researchers that the typical screwworm female mates only once, while the male continues to mate throughout its life time. These factors led to the present concept of the sterile-male screwworm eradication program which utilizes the fly's own reproductive cycle as a means of limiting infestations.

Due to the active U.S. Department of Agriculture sterile-male program and the cool winter of 1959, the screwworm fly was eliminated from Florida and the southeastern United States. Once the population was destroyed in the Southeast, it became impossible for the screwworm flies to reinfest the Florida area by any route other than from the Southwest.

In the Southwest a barrier zone was established to prevent screwworm flies from moving north from Mexico. This artificial barrier, which is maintained by the released sterile flies, helps to prevent reinfestation of the Southwest once the overwintering areas of Texas and northern Mexico are freed of the flies. The present barrier zone stretches 2,000 miles along the United States-Mexico border.

Table 1 shows the total number of screwworm infestations reported in Texas by month since the beginning of the eradication program in 1962. Of particular interest are the outbreaks occurring in 1968, 1972, and 1973. These outbreaks have in general been attributed to the weather conditions in those years. However, until recently there has been no real way to quantify the potential of having a screwworm outbreak in terms of a given set of weather conditions.

The combined efforts of the authors working in conjunction with Dr. C.M. Barnes of NASA/Houston's Health Applications Office and of Dr. R. Felch of this bulletin's staff have produced some encouraging results.

ROLE OF WEATHER

Briefly stated the weather condition during certain critical phases of the screwworm's life cycle were compared with the resulting growth per generation of the fly. A simple model of the screwworm's life cycle was constructed based on knowledge drawn from the technical literature. This model was used to calculate the average weather and resulting growth per generation for several years of historical data in the southwestern United States.

Although still tentative, analysis of this data base has produced several interesting results. Correlation studies revealed the screwworm is particularly sensitive to the soil moisture conditions as measured by the Crop Moisture Index during the pupae phase. In addition, air temperature during the adult phase prior to egg disposition is a key factor influencing both survival and activity.

Further work has resulted in the definition of a weather potential for screwworm based on temperature and soil moisture. This was accom-

[1] Work conducted under the auspices of National Aeronautics and Space Administration Contract NAS 9-12200.

Table 1. Number of Screwworm cases reported in Texas by month for the period 1962 through September, 1974.

	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974
JAN	8	157	0	4	22	1	0	9	0	0	11	9	26
FEB	113	10	0	0	1	2	0	9	0	1	3	8	20
MAR	330	50	7	0	0	0	2	8	0	7	101	5	60
APR	2633	357	29	18	13	19	43	37	1	13	896	26	176
MAY	6308	451	36	45	39	17	190	55	0	16	4197	54	590
JUN	8300	439	15	138	46	15	427	31	20	17	15889	145	628
JUL	10267	304	8	53	38	69	651	5	54	30	15331	350	546
AUG	5088	81	1	39	3	55	820	1	4	29	18341	1013	437
SEP	3967	439	3	25	186	106	1558	2	5	114	16882	1786	-
OCT	8702	1726	51	35	609	484	4046	2	4	141	14503	2254	-
NOV	2710	861	72	65	204	63	1405	1	4	45	4413	2740	-
DEC	1058	43	1	44	42	4	126	1	0	31	413	486	-
TOTAL	49484	4916	226	466	1203	835	9268	161	92	444	90980	8913	

plished by observing the maximum growth per generation under a given set of meteorological conditions. For commonly repeated conditions a wide range of growths were observed. Those growths less than the potential can be attributed to a variety of factors including a lack of wounds, natural predators, and the eradication program itself. Some points were observed which represented greater than expected growth. This was probably due to migration of flies into the area to take advantage of favorable conditions. Careful analysis of all available data resulted in the weather potential functions given in Table 2.

The screwworm potential given as a function of air temperature has a gradual increase from zero near 50°F to a maximum in the low 80's followed by a sharp decrease around 85°. The optimum temperature range for screwworm development is from 75° to 85°F. The Crop Moisture Index (CMI) was used as a measure of near surface soil moisture. The screwworm potential as a function of soil moisture increases to a maximum near 0.8 and than falls with increasing moisture.

Table 3 shows an analyses of five years of screwworm infestation data for two Texas divisions in terms of weather potential. The selected divisions are on the U.S.-Mexican border where screwworm flies are generally present. This availability is important in evaluating the usefulness of the derived functions. The key point is that while an area may have ideal weather conditions for screwworm development if it is isolated from any source of infection there will be no problem.

Table 2. Weather potential for temperature during the adult phase and for soil moisture (CMI) during the pupae phase.

Temperature °F		CMI	
Mean	F (T)	Mean	F(CMI)
58	.137	-4.0	.333
60	.155	-3.0	.333
62	.192	-2.0	.333
64	.234	-1.0	.361
66	.282	-0.5	.461
68	.352	-0.2	.467
70	.451	0.0	.514
72	.563	0.2	.625
74	.718	0.4	.833
76	.859	0.6	.972
78	.958	0.8	1.000
80	.991	1.0	.986
82	1.000	1.5	.805
84	.930	2.0	.667
86	.380	2.5	.569
88	.309	3.0	.500
90	.268	3.5	.458
92	.225	4.0	.444

As can be seen from Table 3, when both temperature and moisture are limiting the number of reported screwworm cases is low. As weather conditions become more favorable, the number of cases increases. The 1972 data for the Trans Pecos divisions might appear on first examination to be out of line with this statement. However, a look at the weekly data shows that most of the unfavorable weather occurred in the early part of the summer and was followed by a long period of high weather potential. It is important to remember that the level of infestation results both from the nature of a summer's weather and from the distribution of favorable and unfavorable periods.

Table 3. Percent of weeks in which moisture and/or temperature limited screwworm populations with comparative infestation data for two Texas divisions.

Year	Division	Both	One	None	Cases
1971	Southern	14.3	65.7	20.0	36
1971	Trans Pecos	34.3	48.6	17.1	45
1973	Trans Pecos	17.1	60.0	22.8	164
*1974	Trans Pecos	21.6	63.0	7.4	261
*1974	Southern	7.4	51.8	40.7	1023
1968	Trans Pecos	8.6	62.8	28.6	1266
1968	Southern	8.6	25.7	65.7	2725
1973	Southern	2.8	42.8	54.3	3960
1972	Trans Pecos	31.4	28.6	40.0	4428
1972	Southern	8.6	22.8	68.6	16242

* 1974 data through September 14.

In summary it seems clear that the weather has played a large contributory role to the past shortcomings as well as to the successes of the screwworm eradication program. The parameterization of the effects of weather on screwworm development described here is a promising new way to analyze historical data and a base from which to develop a monitoring system for potential future outbreaks.

UNITED STATES-MEXICO COOPERATION

When conditions are favorable for fly development, there is always the possibility that the flies can break through the zone and become re-established in the United States. By moving the barrier zone further south into Mexico, the problem of frequent outbreaks would be eliminated.

A cooperative United States-Mexico survey showed that by eradicating the screwworm from Mexico and establishing a new barrier of sterile flies along the 140-mile wide Isthmus of Tehuantepec could be practical and economical. Beginning in 1975, a joint effort by the American and Mexican governments will attempt to create the buffer zone across from Mexican Isthmus of Tehuantepec in southern Mexico to prevent the yearly influx of the fly into northern Mexico and the United States.

According to USDA estimates, if the eradication program was not operating, losses due to screwworms would be $200 million annually. The current operating cost for the eradication program is placed at 22.3 million annually. In 1972, which was a year of major outbreaks, actual losses were placed at $50 million. Thus, an additional $150 million loss to the cattle industry was averted through the program.

Note: Copies of a complete literature survey Selected Parameters influencing the growth and Survival of Cochliomyia hominivorax (Coquerel) are available from Morgan S. Gibson, Lockheed Electronics, 16811 El Camino Real, Houston, Texas 77058.

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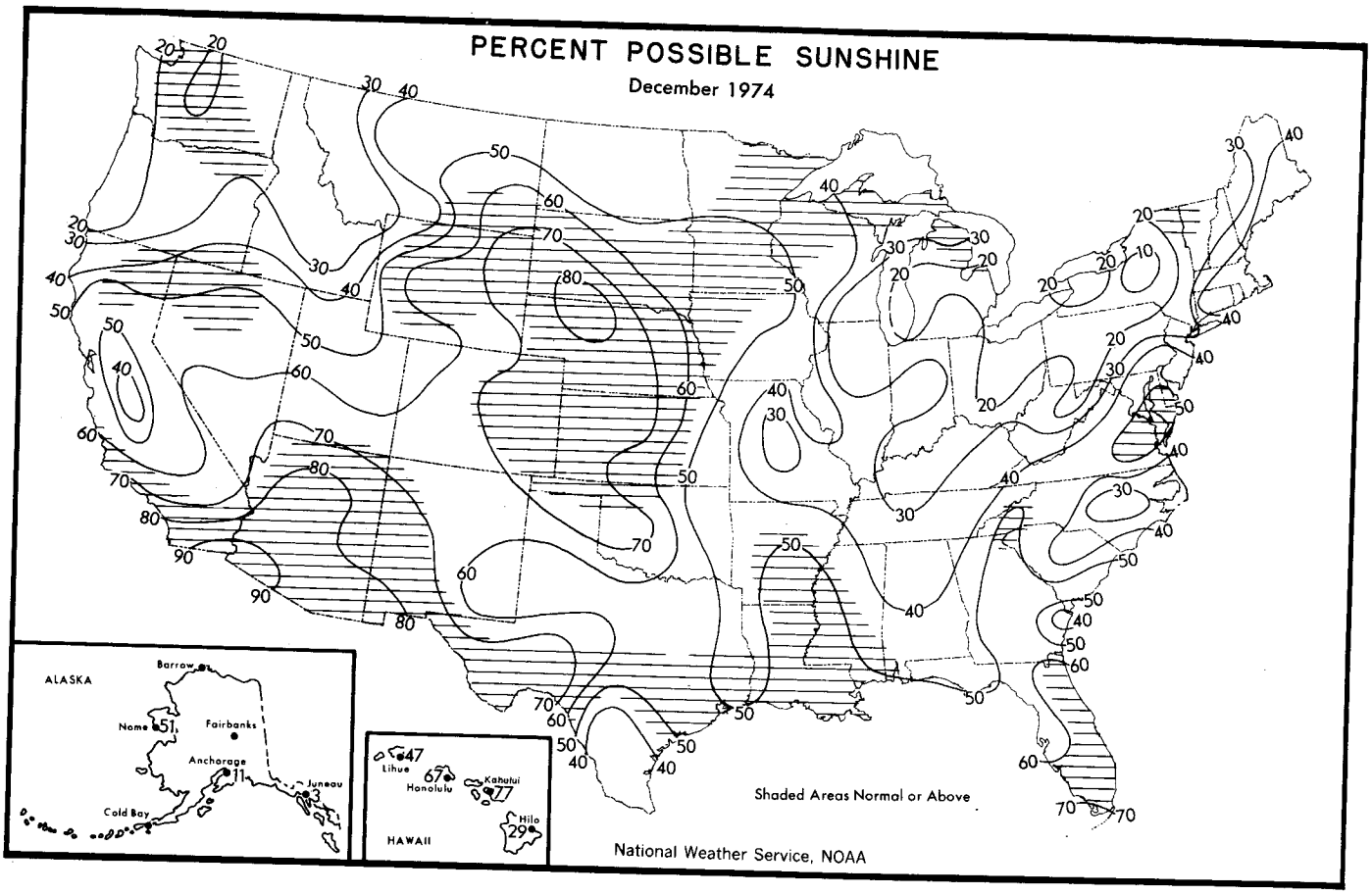

The Percent Possible Sunshine map represents the number of hours that sunshine occurred during the month relative to the total possible hours under clear skies, expressed as a percentage. The shading indicates the areas which received more hours of sunshine than expected during the month of December.