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TOUR OF SOME U.S. GRAIN STORAGE FACILITIES FOR ENTENTE FUND OFFICIALS

Do Sup Chung

Kansas State University

Prepared for:

Agency for International Development

May 1972

U.S. Grain Storage Facilities for Interim Food Officials

SUMMARY OF REPORT/PUBLICATION

Title of Report/Publication: Tour of Some U.S. Grain Storage Facilities for Entente Fund Officials.

Author: Dr. Do Sup Chung

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Project Title: Technical Assistance in Food Grain Drying, Storage, Handling and Transportation.

Contract Number: AID/csd-1588

Contractor: Food and Feed Grain Institution, Kansas State University, Manhattan, Kansas

Principal Consultant: Dr. Do Sup Chung

SUMMARY STATEMENT

Kansas State University was asked by USAID/Washington to provide a tour of grain storage facilities, especially those of metal construction, for Entente Fund storage officials.

There appeared to be a question as to whether metal storage structures would be suitable for grain storage under climatic conditions in Entente Fund countries. Condensation due to day-night fluctuation in temperature was a primary concern.

Fundamental principles involved in condensation and the potential for its being a problem in grain storage under Entente Fund country conditions were discussed at Kansas State University prior to visiting actual storage facilities. It was pointed out that although day-night temperature fluctuations are great, condensation should not be a serious problem because of the generally low relative humidity of the area.

Metal and other types of storage facilities were visited on a four-day tour of areas in western Kansas and Texas where comparable climatic conditions exist.

TOUR OF SOME U.S. GRAIN STORAGE FACILITIES FOR ENTENTE FUND OFFICIALS

Prepared by
Dr. Do Sup Chung
Food and Feed Grain Institute
Kansas State University
May 11-16, 1972

Prepared for the

AGENCY FOR INTERNATIONAL DEVELOPMENT

AID/csd-1588
Technical Assistance in
Food Grain Drying, Storage, Handling and Transportation

at the
FOOD AND FEED GRAIN INSTITUTE
Kansas State University
Manhattan, Kansas 66506

Dr. William J. Hoover, Director
Dr. Leonard W. Schruben, Associate Director
Dr. Richard Phillips, Agricultural Economist
Dr. Harry B. Pfost, Agricultural Engineer
Dr. Do Sup Chung, Agricultural Engineer
John R. Pedersen, Entomologist

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TOUR OF SOME U.S. GRAIN STORAGE FACILITIES FOR ENTENTE FUND OFFICIALS

Introduction

The Food and Feed Grain Institute, Kansas State University, was requested by USAID/Washington, D.C., to host the Entente Fund Officials from Niger, Upper Volta and Ivory Coast in West Africa, who were interested in knowing more about grain storage practices and facilities, especially metal storage facilities for bagged grains under climatic conditions similar to theirs.

The Entente Fund Officials we hosted were:

Mr. Ganoua Sillemane
Director, National Office of Food Products, Niger

Mr. Idrissa Thiombiano
Director, National Office of Cereals, Upper Volta

Mr. Jacques Gurgand
Technical Advisor, Agronomist, Entente Council, Ivory Coast

Accompanying these officials was Miss Sara Jane Littlefield, USAID Central West African Regional Development Officer, who is stationed in Niamey, Niger.

The original itinerary prepared for the visiting group had to be altered because of a one-day late arrival in Manhattan, Kansas. The revised itinerary is appended to the report. As seen in the itinerary, one-half day was scheduled for orientation on grain storage practices and facilities and for discussing grain storage problems experienced in West Africa with Food and Feed Grain Institute staff members prior to on-site visits to metal storage facilities for bagged grains.

Orientation and Discussion at KSU

Staff members who were involved in orientation and discussion were Dr. Harry B. Pfost, Dr. Do Sup Chung and Mr. John R. Pedersen. Incidentally, Dr. Pfost was one of the reviewers for the proposal made by Mr. F. W. Pieschl, AID Consultant, on prefabricated metal buildings for the Entente Grain Stabilization program.

During orientation and discussion, the visiting group was briefed by staff members on fundamentals of grain storage, structural aspects of grain storage, and grain storage practices. In addition, curricula of the Department of Grain Science and Industry and activities of the Food and Feed Grain Institute, especially contract AID/csd-1588 Technical Assistance in Food Grain Drying, Storage, Handling and Transportation, were explained. They were very much interested in the Grain Storage and Marketing Short Course offered at Kansas State University under contract AID/csd-1588 and expressed their desire to send personnel for this type of training in the future.

The climatological data near the metal storage buildings for bagged grains to be visited (Wichita and Dodge City, Kansas, and Amarillo, Texas) and other reference materials were distributed to the visiting group, and we discussed the problems associated with grain handling and storage facilities and practices in West Africa. They were very much concerned with condensation problems that may occur in a metal storage building due to a large day and night temperature differential experienced in West Africa. We informed them that no serious problem on condensation of water vapor would exist in a metal storage building under normal climatic conditions in West Africa such that grain stored would be adversely affected.

Discussion of Potential for Condensation

Although day and night air temperature difference is great, condensation problems are not likely to exist because of the low relative humidity of air in the West African region (normal relative humidity: below 10%). To illustrate this point, a psychrometric chart is appended to the report. For example, air at 110°F and 10% R. H. would condense at a temperature below 41.5°F (dew point), and the condensation temperature of air at 100°F and 10% R. H. is 35°F (see psychrometric chart).

It can be expected that the relative humidity of air inside a metal storage building would be higher than that of outside air because of some moisture evaporation from grain. Note that the equilibrium relative humidity for corn at 13% moisture, dry basis, at 90°F air temperature is about 70%. Therefore, if the relative humidity of air surrounding grain is below 70%, grain at 13% moisture will lose moisture. To illustrate this point, isotherm curves (relationships between equilibrium moisture content of grain and relative humidity of air at a given temperature) for various grains are given in the figure appended. For example, the equilibrium moisture content of grain sorghum at an air temperature of 90°F and R. H. of 10% is 5%, dry basis, (see the figure). Therefore, in general, the loss of moisture from grain during storage is expected rather than the gain of moisture in a hot and dry climate. The increase in relative humidity of air inside a building would raise the dew point of air, but the temperature of air inside a building during night time would rarely reach dew point because of release of heat absorbed by grain during day time under climatic conditions in West Africa.

However, in order to reduce the possibility of condensation, the following aspects should be considered in metal storage buildings for bagged grains:

1. Adequate ventilation in a building.

2. Paint the building white.

3. Do not stack grain bags against the wall.

4. If the condensation problem still exists in a building, cover the grain pile with a plastic sheet, or put insulation (i.e. 2" thick fiber-glass) on the roof inside of the building. This will create at least 20°F temperature differential between the outside and inside air. Thus it would reduce drastically condensation problems.

Tour of Storage Facilities

On-site visits to metal buildings for bagged grains which are located in areas with climatic conditions similar to those of West Africa had been arranged for the visiting group. The locations and characteristics of the facilities visited are (please refer to the itinerary and climatological data appended):

1. Halstead, Kansas, Dekalb Seed Co.

Prefabricated steel (corrugated) warehouse 60' x 160' x 16'.
Concrete floor, roof and walls insulated with 2" fiber-glass and painted with white paint.
Four natural draft ventilators on the roof.
Type of grain stored: Wheat stored in brown paper bags (some plastic reinforced bags).
Maximum capacity: 80,000 bags (50 lbs/bag).
Builder: Butler Manufacturing Co., U.S.A.
Cost: $70,000 including insulation (1970).
Expected life of building: 30 years (for insurance and tax purposes) with a five-year effective paint life.
Remarks: The temperature differential between outside and inside air is at least 25°F. No problem of condensation throughout a year.

2. Ulysses, Kansas, Dekalb Seed Co.

Prefabricated steel (corrugated) warehouse 80' x 200' x 18'.
Concrete floor, truck loading dock, only roof insulated with 2" fiber-glass and painted with white paint.
Five natural draft ventilators on the roof.
Type of grain stored: Grain sorghum in brown paper bags (some plastic reinforced).
Maximum storage capacity: 170,000 (50 lbs/bag).
Builder: Star Manufacturing Co., U.S.A.
Cost: Approximately $70,000 (1969).

Expected life of building: 30 years with a five-year effective paint life.
Remarks: The temperature differential between the outside and inside air is at least 20°F. No problem of condensation throughout the year.

3. Dumas, Texas, Dekalb Seed Co.

Prefabricated steel (corrugated) warehouse 100' x 300' x 22'.
Concrete floor, no insulation on the roof and wall.
Eight natural draft ventilators on the roof.
Type of grain stored: Grain sorghum stored in brown paper bags (some plastic reinforced).
Builder: Star Manufacturing Co., U.S.A.
Expected life of building: 30 years with five-year effective paint life.
Remarks: No problem of condensation throughout the year.

In addition to the above facilities, they observed the tile storage building for bagged grains (80' x 240' x 18'), steel storage bins (100 T.) and continuous dryers at Ulysses, Kansas, and commercial concrete upright storage facility at FARMARCO, Hutchinson, Kansas. Also observed were irrigation practices (flood and sprinkler types) at the experiment farms of Dekalb Seed Co. in Ulysses, Kansas, and Dumas, Texas.

At the end of the trip, the Entente Fund Officials expressed their thanks to the University and USAID for assistance and guidance. They also indicated that the trip was interesting and informative and they learned a great deal.

In concluding the report, we, the Food and Feed Grain Institute, Kansas State University, wish to express our sincere appreciation to the Dekalb Seed Co. Personnel, especially to Mr. Wayne Smith, Halstead, Kansas; Mr. Randy Moore, Ulysses, Kansas; and Mr. Darrel Reynolds for their cooperation and assistance.

ITINERARY

FOR

the Entente Fund Officials from West Africa

Sponsored by U.S. Agency for International Development

Names: Mr. Ganoua Sillemane, Director, National Office of Food Products, Niger

Mr. Idrissa Thiombiano, Director, National Office of Cereals, Upper Volta

Mr. Jacques Gurgand, Technical Advisor, Entente Council, Ivory Coast

Accompanied by Miss Sara Jane Littlefield, USAID, Central West African Regional Development Officer

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Date	Time	Location
May 11, 1972 Thursday	6:32 p.m.	Arrive Manhattan, Kansas, via FL 559.
May 12, 1972 Friday	8:00 a.m. - noon	Visit Grain Science Dept., Kansas State University, Manhattan, Kansas. Discuss the problems concerning grain storage with the staff members. Contact: Dr. Do Sup Chung Phone: (913) 532-6161 or (913) 532-5580
	Lunch Break	
	2:00 p.m.	Leave Manhattan for Hutchinson, Kansas
	4:30 - 6:30 p.m.	Visit FARMARCO, Inc., Hutchinson, Kansas Contact: Dr. Wayne Henry Phone: (316) 663-1571
May 13, 1972 Saturday	8:00 a.m.	Leave Hutchinson for Halstead, Kansas
	9:00 a.m. - 11:00 a.m.	Visit Dekalb Seed Co., Halstead, Kansas, for observing metal storage facilities for bagged grains. Contact: Mr. Wayne Smith Phone: (316) 835-2687
	11:00 a.m.	En route to Ulysses, Kansas.
	4:00 - 6:00 p.m.	Visit Dekalb Seed Co., Ulysses, Kansas, for observing metal and tile storage facilities for bagged grains. Contact: Mr. Randy Moore Phone: (316) 356-1281

Date	Time	Location
May 14, 1972 Sunday		Open
May 15, 1972 Monday	8:00 - 9:00 a.m.	En route to Dumas, Texas.
	9:00 - 12:00 noon	Visit Dekalb Seed Co., Dumas, Texas, for observing metal storage facilities for bagged grains. Contact: Mr. Darrel Reynolds Phone: (806) 935-5623
	12:00 noon	Enroute to Amarillo, Texas.
May 16, 1972 Tuesday	Morning	Leave Amarillo, Texas, for Washington, D.C., via Dallas, Texas.

NOTE: Dr. Do Sup Chung, Food and Feed Grain Institute, and Mr. Mehdi Adlouni, Interpreter, will accompany them for the field trip (by State vehicle).

Appendix

Climatological Data, Annual Summary with Comparative Data

Wichita, Kansas	1971
Dodge City, Kansas	1971
Amarillo, Texas	1971

Psychrometric Chart

Moisture-Relative Humidity Equilibrium Charts for Corn, Sorghum, Wheat and Rough Rice

A UNITED STATES DEPARTMENT OF COMMERCE PUBLICATION

LOCAL CLIMATOLOGICAL DATA
ANNUAL SUMMARY WITH COMPARATIVE DATA

WICHITA, KANSAS

1971

U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION ENVIRONMENTAL DATA SERVICE

NARRATIVE CLIMATOLOGICAL SUMMARY

Wichita lies in the path of alternate masses of warm, moist air moving northward from the Gulf of Mexico and cold, dry air moving southward from the Polar Regions. Consequently, weather in this area is subject to frequent and often abrupt changes. Summer months are usually warm and occasionally the term "hot" is a better description. Winters are usually mild. The temperature extremes for the period of weather records at Wichita are 114° on August 12, 1936, and -22° on February 12, 1899. On the average, temperatures of 90° or above occur on 60 to 65 days per year, while readings of zero or lower occur on about two days per year.

Wichita has an elevation of a little more than 1,300 feet above sea level. This elevation is conducive to a greater night and day temperature range than would be expected at lower altitudes. The surrounding terrain is of a gentle, sloping character with no large bodies of water which affect the climatic conditions in the vicinity. The average freeze-free period has a duration of about six and one-half months, extending from mid-April to late October.

It is of significance to agriculture that a large portion of the precipitation falls during the growing season. The six months, April through September, account for about 70 percent of the annual precipitation. The highest monthly averages are in the spring and summer while January is usually the driest month. The wettest year of record was 1951 with 50.48 inches. The driest year was 1966 with 12.15 inches; however, the driest 12-month period was May 1966, through April 1967, with only 10.25 inches. Thunderstorms occur on about 56 days per year with the greatest frequency during spring and early summer. Hail accompanying thunderstorms is not uncommon; however, hail damage is infrequent.

Brief flooding occasionally results from very heavy thunderstorm rainfall; but, with the completion of the Wichita-Valley Center Flood Control Project Works, in 1959, Wichita is now protected against floods from the Arkansas River, Little Arkansas River, Cowskin Creek, Chisholm Creeks, and the Big Slough. This project, a series of floodways and diversion canals, was designed to protect against floods up to the 75-100 year frequency class. No flooding from major streams has occurred since October 2, 1955.

Snow is light, averaging about 15 inches per year. The heaviest amounts of snow occur in the months of December through March. January has the highest monthly average; however, the greatest monthly fall on record was 20.5 inches in February 1913, and heaviest 24-hour fall was 13.5 inches on March 15-16, 1970.

The prevailing wind direction is southerly and the average velocity compares with other midwestern areas. The windiest months of the year are March and April with averages of 14.8 miles per hour for both months. July has the least wind with an average of 11.3 m.p.h. while the annual average is 12.8 m.p.h. There is often a marked variation in wind velocity through the day, increasing during the warmest hours of the afternoon and diminishing during the nighttime hours. Strong northerly winds often follow the passage of the occasionally severe cold fronts characteristic of Great Plains weather. On rare occasions during the summer, strong, hot, dry southwesterly winds do considerable damage to growing crops in just a few hours. The fastest wind ever recorded was 100 m.p.h., from the north, during a passing squall. Tornadoes have been observed in the vicinity on occasions.

Flying weather conditions are generally favorable for operation of light airplanes with the visibility 7 miles or more and the ceiling 1,000 feet or higher 95 percent of the time. Gusty surface winds are rather frequent, especially in the spring and summer. The strongest winds are associated with thunderstorms and frontal weather.

METEOROLOGICAL DATA FOR THE CURRENT YEAR

Station WICHITA, KANSAS MUNICIPAL AIRPORT Standard time used CENTRAL Latitude 37° 39' N Longitude 97 25' W Elevation (ground) 1321 feet Year 1971

Month	Temperature: Averages: Daily maximum	Daily minimum	Monthly	Extremes: Highest	Date	Lowest	Date	Degree days (Base 65°): Heating	Cooling	Precipitation: Total	Greatest in 24 hrs	Date	Snow, Ice pellets: Total	Greatest in 24 hrs	Date	Relative humidity: Hour 00 (Local time)	Hour 06	Hour 12	Hour 18	Wind &: Resultant: Direction	Speed	Average speed	Fastest mile: Speed	Direction #	Date	Percent of possible sunshine	Average sky cover sunrise to sunset	Number of days: Sunrise to sunset: Clear	Partly Cloudy	Cloudy	Precipitation .01 inch or more	Snow, Ice pellets 1.0 inch or more	Thunderstorms	Heavy fog	Temperatures: Maximum: 90 and above	32 and below	Minimum: 32 and below	0 and below	Average daily solar radiation - langleys
JAN	39.3	18.2	28.8	70	29	-4	6	1118	0	0.58	0.98	2-3	T	T	31 +	80	86	62	69	01	3.2	11.4	42	NW	4	69	5.9	10	7	14	2	0	1	3	0	10	31	0	
FEB	38.1	19.5	28.8	64	17	-6	8	1005	0	1.70	1.01	21-22	16.7	11.9	21-22	82	83	71	75	35	2.2	12.9	39	NE	21	51	7.1	6	6	16	6	3	2	3	0	9	26	3	
MAR	56.6	31.4	44.0	80	30	14	3	643	0	0.01	0.01	14	T	T	24 +	66	72	48	46	29	1.0	15.6	57	NW	18	72	5.4	11	8	12	1	0	0	1	0	1	21	0	
APR	69.4	44.5	57.0	83	12	24	7	253	19	2.25	1.77	22-23	0.0	0.0		62	68	47	43	16	3.1	14.5	47	NW	1	65	5.2	11	8	11	7	0	4	0	0	0	5	0	
MAY	76.4	51.3	63.9	92	17	30	13	95	65	3.02	1.82	21-22	0.0	0.0		70	79	50	50	18	3.9	13.8	49	SE	21	61	5.2	9	14	8	9	0	9	0	2	0	0	0	
JUN	90.1	67.7	78.9	102	24	60	1	0	425	2.70	1.16	2	0.0	0.0		67	73	48	45	18	9.3	13.8	51	SW	2	65	5.8	8	12	10	12	0	12	0	15	0	0	0	
JUL	89.4	66.6	78.0	102	17+	53	31	4	414	6.55	1.48	4	0.0	0.0		68	78	49	45	15	9.9	11.3	42	S	4	68	5.0	11	11	9	8	0	9	0	18	0	0	0	
AUG	88.8	64.8	76.8	96	26+	58	3	0	372	1.49	0.93	28	0.0	0.0		72	83	51	47	16	6.5	9.4	34	NW	21	63	4.5	13	13	5	3	0	6	0	18	0	0	0	
SEP	81.5	60.0	70.8	100	7	41	20	77	459	1.73	0.81	24	0.0	0.0		72	82	53	49	17	9.1	13.1	35	S	30+	61	4.9	12	7	11	6	0	2	1	10	0	0	0	
OCT	72.8	48.3	60.6	88	12	32	31	165	34	5.54	2.30	29	0.0	0.0		77	83	54	55	19	2.6	11.4	34	S	18	71	4.2	17	4	10	8	0	2	2	0	0	1	0	
NOV	54.0	33.7	43.9	71	15+	22	7	628	0	2.49	0.74	17	2.3	2.3	22	82	86	66	74	20	2.4	11.1	33	NW	26	60	5.8	10	5	15	6	1	3	1	0	1	17	0	
DEC	43.5	28.0	35.8	59	25	14	31+	897	0	0.95	0.46	14-15	2.4	1.8	2-3	88	90	82	82	16	1.0	9.6	32	NE	14	41	6.9	9	3	19	10	1	1	13	0	1	25	0	
YEAR	66.7	44.5	55.6	102	JUL. 17+	-6	FEB. 8	4885	1588	29.61	2.50	OCT. 29	21.4	11.9	FEB. 21-22	74	80	57	55	17	2.6	12.3	57	NW	MAR. 18	63	5.5	127	98	140	78	5	51	24	63	22	126	3	

NORMALS, MEANS, AND EXTREMES

Month	Temperature: Normal: Daily maximum	Daily minimum	Monthly	Extremes: Record highest	Year	Record lowest	Year	Normal heating degree days (Base 65°)	Precipitation: Normal total	Maximum monthly	Year	Maximum monthly	Year	Maximum in 24 hrs	Year	Snow, Ice pellets: Mean total	Maximum monthly	Year	Maximum in 24 hrs	Year	Relative humidity: Hour 00 (Local time)	Hour 06	Hour 12	Hour 18	Wind &: Mean speed	Prevailing direction #	Fastest mile: Speed	Direction #	Year	Percent of possible sunshine	Mean sky cover sunrise to sunset	Mean number of days: Sunrise to sunset: Clear	Partly cloudy	Cloudy	Precipitation .01 inch or more	Snow, Ice pellets 1.0 inch or more	Thunderstorms	Heavy fog	Temperatures: Max: 90 and above	32 and below	Min: 32 and below	0 and below	Average daily solar radiation - langleys
(a)	(b)	(b)	(b)	19		19		(b)	(b)	18		18		18		18	18		18		18	18	18	18	18	10	18	18		18	18	18	18	18	18	18	18	18	18	18	18	18	10	18
J	41.6	22.3	32.0	75	1967	-12	1962	1023	0.81	1.37	1960	0.02	1961	0.98	1971	3.7	18.5	1962	13.0	1962	76	79	63	65	12.7	S	57	N	1965	58	6.1	10	6	15	5	1	•	3	0	9	28	1	
F	47.0	25.6	36.3	81	1962	-6	1971	804	0.92	1.71	1955	0.02	1963	1.35	1955	3.9	16.7	1971	11.9	1971	74	79	60	59	13.0	N	54	N	1965	59	6.0	8	7	13	5	1	1	3	0	5	23	•	
M	55.9	33.0	44.5	89	1956	-2	1960	645	1.64	4.83	1961	0.01	1971	2.65	1961	3.5	16.5	1970	13.5	1970	68	75	52	50	14.6	S	60	N	1965	61	6.1	9	8	14	7	1	2	1	0	2	17	•	
A	68.2	45.2	56.7	94	1956	17	1962	270	2.30	4.49	1970	0.22	1963	2.40	1969	0.1	1.3	1957	0.8	1959	69	77	50	48	14.7	S	63	W	1964	62	6.1	8	8	14	7	0	5	1	•	•	3	0	
M	77.1	54.9	66.0	100	1967+	32	1966	87	3.97	7.57	1957	0.76	1966	4.70	1963	0.0	0.0		0.0		75	82	55	52	13.4	S	58	S	1962	63	6.0	9	9	13	10	0	0	1	0	•	0	0	
J	87.7	65.2	76.5	106	1956	43	1969	6	4.21	10.46	1957	0.94	1954	4.98	1965	0.0	0.0		0.0		75	83	54	50	12.7	S	64	NW	1957	68	5.9	9	10	11	10	0	10	•	12	0	0	0	
J	92.4	69.4	80.9	113	1954	52	1967	0	3.64	9.22	1962	0.19	1954	3.74	1969	0.0	0.0		0.0		68	79	50	46	11.3	S	66	Na	1956	73	4.9	12	11	8	9	0	9	•	21	0	0	0	
A	92.8	68.8	80.8	110	1964	46	1967+	0	2.87	7.91	1960	0.59	1957	3.75	1959	0.0	0.0		0.0		68	79	49	44	11.3	S	67	NW	1964	73	4.5	14	10	7	7	0	7	•	19	0	0	0	
S	83.7	58.9	71.3	103	1954	35	1967	33	3.22	8.44	1965	0.03	1956	3.03	1968	0.0	0.0		0.0		73	81	55	52	11.9	S	56	N	1956	68	4.7	14	6	10	8	0	6	1	7	0	0	0	
O	71.7	48.0	59.9	95	1954	23	1957	229	2.40	6.13	1959	T	1958	4.24	1955	T	0.1	1960	0.1	1960	73	80	53	55	12.4	S	52	S	1961	67	4.7	14	7	10	6	0	3	•	1	0	0	0	
N	55.1	33.7	44.4	80	1956	8	1962+	618	1.69	5.88	1964	T	1954	4.33	1964	0.6	2.7	1959	2.4	1958	73	78	55	60	12.3	S	51	N	1964	62	5.4	11	7	12	4	•	1	2	0	1	14	0	
D	44.9	26.6	35.8	83	1955	-5	1968+	905	0.94	2.25	1965	0.03	19..3	1.27	1965	3.2	9.7	1967	5.1	1964	76	79	62	66	12.2	S	54	NW	1963	57	6.1	9	8	14	6	1	•	4	0	1	26	•	
YR	68.2	46.0	57.1	113	JUL. 1954	-12	JAN. 1962	4620	28.41	10.46	JUN. 1957	T	OCT. 1958+	4.98	JUN. 1965	15.0	18.5	JAN. 1962	13.5	MAR. 1970	72	79	55	54	12.7	S	66	NW	JUL. 1956	65	5.5	127	97	141	82	4	55	18	63	22	114	2	

Means and extremes above are from existing and comparable exposures. Annual extremes have been exceeded at other sites in the locality as follows: Highest temperature 114 in August 1936; lowest temperature -22 in February 1899; maximum monthly precipitation 14.43 in June 1923; minimum monthly precipitation 0.00 in October 1952; maximum precipitation in 24 hours 7.99 in September 1911; maximum monthly snowfall 20.5 in February 1913; fastest mile of wind 100 from North in July 1948.

(a) Length of record, years, based on January data. Other months may be for more or fewer years if there have been breaks in the record.
(b) Climatological standard normals (1931-1960).
• Less than one half.
+ Also on earlier dates, months, or years.
T Trace, an amount too small to measure.
Below zero temperatures are preceded by a minus sign.
The prevailing direction for wind in the Normals, Means, and Extremes table is from records through 1963.
‡ ≥ 70° at Alaskan stations.

Unless otherwise indicated, dimensional units used in this bulletin are: temperature in degrees F., precipitation, including snowfall, in inches; wind movement in miles per hour; and relative humidity in percent. Heating degree day totals are the sums of negative departures of average daily temperatures from 65° F. Cooling degree day totals are the sums of positive departures of average daily temperatures from 65° F. Sleet was included in snowfall totals beginning with July 1948. The term "ice pellets" includes solid grains of ice (sleet) and particles consisting of snow pellets encased in a thin layer of ice. Heavy fog reduces visibility to 1/4 mile or less.

Sky cover is expressed in a range of 0 for no clouds or obscuring phenomena to 10 for complete sky cover. The number of clear days is based on average cloudiness 0-3, partly cloudy days 4-7, and cloudy days 8-10 tenths.

Solar radiation data are the averages of direct and diffuse radiation on a horizontal surface. The langley denotes one gram calorie per square centimeter.

& Figures instead of letters in a direction column indicate direction in tens of degrees from true North; i.e., 09 - East, 18 - South, 27 - West, 36 - North, and 00 - Calm. Resultant wind is the vector sum of wind directions and speeds divided by the number of observations. If figures appear in the direction column under "Fastest mile" the corresponding speeds are fastest observed 1-minute values.

To 8 compass points only.

AVERAGE TEMPERATURE

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
#1932	32.4	43.2	38.1	59.9	67.0	75.0	82.8	80.6	71.5	56.8	42.4	31.4	56.8
1933	42.5	33.6	47.6	57.5	67.8	82.6	82.5	78.2	76.0	60.0	49.5	40.6	59.9
1934	36.5	37.9	45.0	57.8	69.2	82.2	88.2	85.3	66.4	64.2	49.6	34.2	59.7
1935	34.7	39.4	52.4	52.8	60.7	71.2	84.6	82.0	70.6	57.4	41.8	34.8	57.0
1936	28.0	25.0	51.0	56.5	69.6	79.0	87.8	89.0	74.2	56.1	44.8	29.8	58.4
1937	24.3	33.7	40.6	56.0	67.6	76.4	81.8	84.0	72.0	58.4	42.0	33.6	55.9
1938	35.6	38.9	51.9	56.7	64.6	74.6	82.2	84.2	74.2	67.0	43.9	38.0	59.3
1939	40.5	30.3	48.0	55.1	69.4	76.4	84.4	80.0	77.6	64.0	46.2	41.1	59.4
#1940	16.2	34.8	46.2	54.6	65.6	75.4	81.4	77.4	71.0	65.8	40.7	37.5	55.6
1941	34.4	34.6	40.6	57.0	69.1	72.7	80.0	79.6	72.2	59.4	45.4	39.6	57.0
1942	32.0	33.8	45.7	59.0	63.6	73.6	80.8	77.2	67.5	58.9	46.8	32.4	55.9
1943	30.0	40.4	39.0	59.6	61.2	76.0	80.9	84.4	68.7	57.6	44.1	31.6	56.2
#1944	36.6	38.8	41.0	51.4	67.8	78.4	79.6	79.6	70.4	60.8	47.5	31.5	57.0
1945	34.1	35.2	51.4	53.0	62.2	70.4	78.6	79.1	69.8	58.0	48.0	28.0	55.6
1946	35.2	44.0	54.0	60.8	61.9	76.3	83.4	79.6	71.0	61.0	44.9	40.0	59.4
1947	34.0	31.8	39.4	53.6	62.4	74.0	79.0	85.0	75.4	68.4	41.6	36.4	56.8
1948	27.8	32.0	39.9	63.0	66.6	75.2	78.2	78.0	73.3	59.4	44.0	36.8	56.1
1949	23.4	32.8	43.7	56.0	67.2	76.5	80.3	76.6	66.2	60.6	50.8	37.2	55.9
1950	30.4	39.4	42.2	57.6	69.5	75.7	73.5	72.8	68.3	65.0	42.3	34.5	55.2
1951	32.2	37.7	39.9	51.9	65.3	71.0	78.7	79.7	66.2	56.8	39.5	33.7	54.4
1952	36.5	40.5	40.7	53.9	66.0	82.5	81.0	81.1	72.8	56.6	43.9	33.0	57.4
#1953	37.4	40.9	49.4	51.8	65.6	83.1	78.7	78.8	75.1	62.6	46.7	36.5	58.9
1954	30.7	45.8	42.6	62.4	61.4	78.5	89.3	85.6	77.6	61.0	49.2	37.3	60.1
1955	34.7	32.3	43.8	62.5	68.3	71.6	84.0	80.6	74.1	59.2	40.8	33.1	57.1
1956	29.5	35.5	45.4	53.1	70.1	79.3	82.4	83.6	74.6	64.3	43.8	37.2	58.2
1957	26.4	39.6	49.9	53.3	63.6	72.7	82.8	80.2	68.1	55.2	41.8	40.4	56.5
1958	34.7	29.7	36.9	51.6	68.9	76.3	78.4	78.6	71.3	60.2	48.3	33.1	55.8
1959	26.5	33.7	46.9	55.4	67.7	76.3	76.4	81.4	71.0	55.2	39.9	40.6	55.9
1960	30.9	28.7	33.8	59.1	64.6	75.4	76.7	79.3	72.4	61.0	46.9	33.0	55.1
1961	31.4	37.2	46.6	53.8	63.3	74.2	78.8	76.8	66.8	59.6	41.8	29.4	55.0
1962	25.6	37.1	43.4	55.1	75.4	75.1	80.0	80.6	68.6	62.3	45.4	34.9	56.9
1963	27.2	36.9	50.0	60.5	68.3	78.6	82.6	81.2	72.5	67.7	47.3	26.6	57.9
1964	36.4	36.1	42.1	59.2	70.2	76.9	85.0	76.8	70.8	58.7	47.2	31.2	57.6
1965	35.2	34.4	36.8	60.4	68.8	76.3	81.9	78.2	68.5	60.4	50.5	41.2	57.7
1966	28.3	33.6	49.1	53.5	65.7	76.2	84.9	76.1	68.6	58.0	48.3	32.7	56.7
1967	34.3	36.3	50.5	61.5	64.0	74.5	76.2	74.7	65.9	57.7	43.2	34.6	56.1
1968	32.5	33.8	48.0	55.5	61.0	76.1	80.3	77.9	67.9	59.3	41.7	30.7	55.4
1969	30.1	36.1	36.1	56.4	65.2	71.0	82.9	78.9	71.9	54.6	44.5	34.6	55.2
1970	27.5	38.5	39.7	55.1	69.3	74.5	81.3	83.2	69.7	53.9	41.5	36.9	55.9
1971	28.8	28.8	44.0	57.0	63.9	78.9	78.0	76.8	70.8	60.6	43.9	35.8	55.6
RECORD MEAN	31.7	35.3	44.7	56.4	65.5	75.3	80.2	79.4	71.1	59.6	45.2	35.1	56.6
MAX	41.2	45.3	55.7	67.3	75.7	85.7	91.0	90.4	82.0	70.5	55.4	44.3	67.1
MIN	22.2	25.0	33.6	45.5	55.2	64.8	69.4	68.3	60.2	48.6	35.0	25.8	46.1

TOTAL DEGREE DAYS

WICHITA, KANSAS

Season	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Total
1932-33	0	0	22	279	678	1042	698	880	544	248	66	0	4457
1933-34	0	0	9	172	469	736	883	760	618	228	36	0	3931
1934-35	0	2	84	92	461	956	908	715	398	372	184	20	4192
1935-36	0	7	34	280	695	936	1148	1160	438	315	24	2	5039
1936-37	0	0	60	290	607	780	1261	876	758	287	64	11	4994
1937-38	0	0	26	252	692	974	910	731	412	282	111	0	4390
1938-39	0	0	26	100	637	836	760	973	530	320	54	0	4216
1939-40	0	0	38	150	566	742	1532	882	602	342	74	8	4936
#1940-41	0	0	41	78	731	852	948	852	756	250	28	2	4538
1941-42	0	0	46	213	588	783	1023	874	600	206	148	16	4497
1942-43	0	0	114	209	548	1006	1086	690	813	187	186	0	4839
1943-44	0	0	18	237	627	1029	878	762	746	409	89	2	4797
#1944-45	0	0	30	143	525	1037	956	830	424	371	191	25	4532
1945-46	0	0	65	227	514	1143	930	587	357	156	136	27	4142
1946-47	0	6	36	167	604	776	960	931	787	352	114	13	4746
1947-48	5	0	17	67	703	889	1148	955	781	120	83	1	4769
1948-49	0	0	19	185	630	871	1280	899	661	293	90	0	4868
1949-50	0	0	59	218	426	861	1065	710	704	392	74	12	4521
1950-51	0	10	28	99	672	937	1010	757	772	408	69	19	4781
1951-52	0	0	59	293	758	964	879	704	747	338	71	0	4813
1952-53	0	0	15	276	643	984	846	670	481	403	156	0	4474
#1953-54	1	0	9	159	542	876	1056	931	687	139	156	13	4169
1954-55	0	0	3	223	467	854	930	911	654	147	14	20	4223
1955-56	0	0	17	198	716	980	1074	848	602	379	52	4	4590
1956-57	0	0	12	96	628	856	1189	705	646	359	103	8	4607
1957-58	0	0	36	323	687	757	932	982	891	334	44	8	4994
1958-59	0	0	39	206	491	984	1187	870	555	300	62	0	4690
1959-60	0	0	41	300	748	747	1050	1048	961	203	97	1	5196
1960-61	0	0	13	171	543	990	1036	771	562	376	129	0	4593
1961-62	0	2	86	184	688	1097	1213	776	665	315	8	4	5038
1962-63	0	0	40	172	581	927	1323	780	463	170	72	0	4528
1963-64	0	0	9	50	523	1124	867	831	702	200	41	10	4417
1964-65	0	1	34	200	531	1038	918	851	868	176	23	0	4640
1965-66	0	1	73	179	428	733	1131	871	490	342	100	2	4350
1966-67	0	0	33	247	499	995	945	798	463	180	143	5	4289
1967-68	2	1	63	280	645	936	998	899	525	285	153	1	4788
1968-69	0	5	22	224	691	1054	1076	804	887	256	77	20	5114
1969-70	0	0	2	361	610	939	1163	738	778	312	43	24	4972
1970-71	1	0	64	358	696	866	1118	1005	643	253	95	0	5099
1971-72	4	0	77	165	628	897							

TOTAL PRECIPITATION

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
#1932	1.49	0.94	0.77	2.33	1.90	7.92	2.53	2.30	1.26	0.40	0.18	1.67	23.69
1933	0.10	0.34	1.72	0.86	2.29	0.83	2.34	8.50	1.39	0.74	0.85	1.85	21.81
1934	0.72	1.03	1.16	3.10	4.14	1.78	1.77	0.38	4.25	1.89	2.90	1.03	24.15
1935	0.87	1.39	0.98	1.86	11.22	7.21	0.39	1.55	3.11	4.41	2.99	0.25	36.23
1936	0.94	0.02	T	0.58	3.35	1.04	0.21	0.04	4.84	3.77	0.01	0.83	15.58
1937	1.54	0.73	2.80	0.57	4.13	3.09	4.77	2.86	1.80	1.12	0.75	0.58	25.64
1938	0.12	2.48	1.91	2.85	8.14	4.49	2.24	5.60	2.62	0.16	2.05	0.15	32.81
1939	1.09	1.93	1.57	2.14	3.25	8.90	0.72	5.84	0.30	1.14	0.81	0.95	28.64
#1940	1.40	1.43	0.74	6.15	5.82	4.89	0.94	2.87	6.14	1.05	3.82	1.56	36.77
1941	1.53	1.09	1.11	2.63	2.89	7.05	2.41	3.54	4.29	4.81	0.78	0.92	33.25
1942	0.23	1.93	0.88	7.08	1.67	8.69	2.34	4.51	7.21	3.77	0.68	3.14	42.13
1943	0.27	0.67	1.21	1.94	6.59	3.43	6.51	1.95	3.14	1.83	0.07	2.33	29.94
#1944	1.01	1.34	4.55	12.42	2.04	1.60	3.49	4.77	2.20	2.20	1.93	3.58	43.53
1945	1.07	0.84	1.85	0.79	1.28	4.00	5.01	4.11	10.59	0.51	0.05	0.62	36.71
1946	2.21	1.29	1.81	1.87	2.11	2.71	0.32	2.90	1.27	4.32	2.14	0.78	23.67
1947	0.71	0.52	2.91	5.20	4.69	2.57	2.89	0.42	0.25	1.50	0.89	2.98	25.93
1948	1.00	1.19	1.51	1.69	1.86	9.76	6.39	2.72	1.05	0.67	3.30	0.25	31.35
1949	6.29	1.80	2.01	3.85	6.15	3.16	6.97	1.13	3.62	1.91	0.06	1.22	38.17
1950	0.52	1.61	0.50	0.68	2.24	4.02	13.37	5.93	1.04	0.48	0.26	0.02	30.87
1951	1.03	2.58	2.69	6.33	7.60	10.07	4.45	5.38	5.59	2.05	1.47	0.24	59.48
1952	0.41	0.35	2.68	1.97	2.31	1.08	4.94	2.52	0.28	0.00	2.40	1.09	20.03
#195	0.15	0.82	3.35	0.57	2.02	2.17	2.39	0.82	0.53	3.77	1.46	1.06	19.11
1954	0.09	0.57	1.30	1.54	4.84	0.94	0.19	0.96	1.09	2.83	T	0.18	14.53
1955	0.61	1.71	0.68	0.72	4.02	3.98	1.30	1.06	3.79	5.84	0.03	0.03	23.77
1956	0.43	0.45	0.91	1.46	1.40	1.28	2.51	0.70	0.03	2.69	0.48	0.36	12.73
1957	0.19	0.77	2.60	3.31	7.57	10.46	1.99	0.59	5.25	0.72	1.45	0.45	37.15
1958	0.81	1.03	4.07	1.23	2.44	3.00	7.19	2.93	6.11	T	2.39	0.49	31.56
1959	0.53	0.23	0.85	2.17	5.53	2.35	7.38	4.20	2.31	6.13	0.30	1.60	33.58
1960	1.37	1.41	1.18	1.28	4.10	4.59	5.57	7.91	2.25	5.03	0.37	1.73	36.79
1961	0.02	1.51	4.83	2.00	4.02	2.61	6.56	3.80	5.24	4.87	2.80	1.01	39.27
1962	1.07	0.47	0.26	1.02	0.99	4.80	9.22	2.95	8.23	1.32	1.62	0.60	32.55
1963	1.22	0.02	1.67	0.27	6.15	4.51	2.70	2.86	4.90	2.47	1.04	0.34	28.10
1964	0.71	0.53	0.89	2.97	5.84	3.73	2.23	0.10	2.66	1.64	5.88	1.03	34.21
1965	0.56	1.39	0.48	2.65	0.26	8.00	3.62	4.91	8.44	0.32	0.11	2.25	38.97
1966	0.23	1.44	0.26	2.21	0.76	2.67	1.78	1.09	0.72	0.47	0.09	0.43	12.15
1967	0.28	0.09	0.97	1.30	1.42	5.62	4.28	1.91	3.19	2.98	0.39	1.41	23.44
1968	0.14	0.20	1.36	2.16	4.37	2.38	3.65	6.41	5.91	3.06	2.47	1.31	33.42
1969	0.45	1.33	1.73	4.30	3.28	6.82	8.23	1.07	4.77	2.10	0.01	1.36	36.17
1970	0.28	0.21	2.70	4.49	1.58	6.72	0.47	2.37	4.04	1.88	0.05	0.49	25.28
1971	0.98	1.70	0.01	2.35	3.02	2.70	0.65	1.49	1.73	5.54	2.49	0.95	29.61
RECORD MEAN	0.79	1.13	1.73	2.85	4.21	4.50	3.49	3.04	3.31	2.42	1.49	1.03	29.39

TOTAL SNOWFALL

Season	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Total
1932-33	0.0	0.0	0.0	0.0	T	2.3	0.0	3.5	0.9	0.0	0.0	0.0	6.7
1933-34	0.0	0.0	0.0	0.0	T	0.0	0.9	4.7	0.2	0.0	0.0	0.0	5.8
1934-35	0.0	0.0	0.0	0.0	0.2	3.0	0.1	0.2	1.0	0.0	0.0	0.0	4.5
1935-36	0.0	0.0	0.0	0.0	0.1	0.1	4.1	0.1	0.0	T	0.0	0.0	4.4
1936-37	0.0	0.0	0.0	0.0	T	2.1	0.3	4.7	4.9	0.0	0.0	0.0	12.0
1937-38	0.0	0.0	0.0	0.0	4.9	T	T	9.3	T	6.2	0.0	0.0	20.4
1938-39	0.0	0.0	0.0	0.0	0.2	T	3.0	7.7	1.5	T	0.0	0.0	12.4
1939-40	0.0	0.0	0.0	0.0	0.0	5.0	11.8	6.1	0.1	0.2	0.0	0.0	23.2
#1940-41	0.0	0.0	0.0	0.0	1.7	0.7	3.8	4.5	8.9	0.0	0.0	0.0	19.6
1941-42	0.0	0.0	0.0	0.2	0.2	3.6	2.2	4.3	T	0.0	0.0	0.0	10.5
1942-43	0.0	0.0	T	0.0	1.3	14.8	2.5	0.1	10.1	0.0	0.0	0.0	28.8
1943-44	0.0	0.0	0.0	0.0	0.2	8.5	0.4	0.3	0.4	T	0.0	0.0	9.8
#1944-45	0.0	0.0	0.0	0.0	T	2.6	1.5	4.3	1.2	0.5	0.0	0.0	10.1
1945-46	0.0	0.0	0.0	0.0	T	5.4	0.8	0.8	0.2	0.0	0.0	0.0	7.2
1946-47	0.0	0.0	0.0	0.0	0.1	T	9.0	7.8	5.2	T	0.0	0.0	22.1
1947-48	0.0	0.0	0.0	0.0	T	3.5	12.0	6.1	4.8	0.0	0.0	0.0	26.4
1948-49	0.0	0.0	0.0	0.0	3.6	1.0	19.6	2.1	0.8	1.5	0.0	0.0	28.6
1949-50	0.0	0.0	0.0	0.0	0.0	3.8	0.5	0.1	0.9	T	0.0	0.0	5.3
1950-51	0.0	0.0	0.0	0.0	T	0.3	0.4	3.8	T	T	0.0	0.0	4.5
1951-52	0.0	0.0	0.0	0.0	0.8	8.1	2.2	3.2	0.5	5.9	T	0.0	20.5
1952-53	0.0	0.0	0.0	0.0	0.0	6.8	0.5	1.7	1.0	0.7	T	0.0	10.7
#1953-54	0.0	0.0	0.0	T	1.4	2.4	0.8	T	T	0.0	0.0	0.0	4.6
1954-55	0.0	0.0	0.0	0.0	0.0	0.2	2.0	5.5	1.1	0.0	0.0	0.0	8.8
1955-56	0.0	0.0	0.0	0.0	0.2	0.1	0.6	3.2	2.9	0.1	0.0	0.0	13.1
1956-57	0.0	0.0	0.0	0.0	T	0.8	2.3	1.9	1.0	1.3	0.0	0.0	7.3
1957-58	0.0	0.0	0.0	T	T	T	3.9	3.3	16.4	0.0	0.0	0.0	23.6
1958-59	0.0	0.0	0.0	0.0	2.4	7.5	8.0	0.3	0.9	0.8	0.0	0.0	20.5
1959-60	0.0	0.0	0.0	0.0	2.7	2.0	0.1	14.5	10.3	T	0.0	0.0	35.6
1960-61	0.0	0.0	0.0	0.1	T	2.6	0.3	10.4	7.5	T	0.0	0.0	20.9
1961-62	0.0	0.0	0.0	0.0	0.1	4.9	18.5	T	T	0.0	0.0	0.0	23.5
1962-63	0.0	0.0	0.0	0.0	T	4.2	3.7	0.2	T	0.0	0.0	0.0	8.1
1963-64	0.0	0.0	0.0	0.0	0.0	4.7	0.2	1.5	T	0.0	0.0	0.0	6.4
1964-65	0.0	0.0	0.0	0.0	0.1	5.4	3.3	2.7	T	0.0	0.0	0.0	11.5
1965-66	0.0	0.0	0.0	0.0	0.0	0.9	4.7	0.8	T	0.0	0.0	0.0	6.4
1966-67	0.0	0.0	0.0	0.0	T	5.0	2.1	T	0.7	0.0	0.0	0.0	7.8
1967-68	0.0	0.0	0.0	0.0	2.2	9.7	0.6	1.0	T	0.0	0.0	0.0	13.5
1968-69	0.0	0.0	0.0	0.0	0.3	2.8	T	8.3	3.1	0.0	0.0	0.0	16.5
1969-70	0.0	0.0	0.0	0.0	T	3.5	2.8	T	16.5	0.1	0.0	0.0	22.9
1970-71	0.0	0.0	0.0	T	T	T	T	16.7	T	0.0	0.0	0.0	16.7
1971-72	0.0	0.0	0.0	0.0	2.3	2.4							

Record mean values above (not adjusted for instrument location changes listed in the Station Location table) are means for the period beginning in 1889.

# Indicates a break in the data sequence during the year, or season, due to a station move or relocation of instruments. See Station Location table.

STATION LOCATION

WICHITA, KANSAS

Location	Occupied from	Occupied to	Airline distance and direction from previous location	Latitude North	Longitude West	Elevation above Sea level: Ground at temperature site	Elevation above Ground: Wind instruments	Extreme thermometers	Psychrometer	Telepsychrometer	Tipping bucket rain gage	Weighing rain gage	8" rain gage	Hygrothermometer	Elevation above Sea level: Pyrrometer	Remarks
CITY																
Sedgwick Building 7th Floor, 1st & Market Streets	6/13/88	5/31/08		37° 41'	97° 20'	1300	86	79	78		72		72			
111-113 E. Douglas Ave.	5/31/08	6/30/11	200 ft. S	37° 41'	97° 20'	1300	121	99	98		91		91			Moved for better exposure.
Beacon Building Suite 611 1st Block S. Main St.	6/30/11	2/28/17	200 ft. S	37° 41'	97° 20'	1300	158	140	139		132		132			Moved for better exposure.
Beacon Building 10th Floor 1st Block S. Main St.	2/28/17	4/26/32		37° 41'	97° 20'	1300	158	140	139		132		132			
New Post Office Bldg., 3rd & Market Streets	4/26/32	11/29/40	2000 ft. NNE	37° 41'	97° 20'	1300	93	86	85		78		78			
AIRPORT																
Munic.,.' Airport	11/29/40	9/27/44	5 mi. SE	37° 38'	97° 16'	1372	61	6	5		4	4	4			Consolidation at Airport Station.
Municipal Airport	9/27/44	11/30/53	None	37° 38'	97° 16'	1372	61	51	50		43	43	43			
Weather Bureau Building New Municipal Airport	12/01/53	Present	8.7 miles WNW	37° 39'	97° 25'	1321	d25	c5	c5	a7	4	5	4	d5		a - Commissioned 5/20/57 and decommissioned 9/1/60. b - Commissioned 9/1/60. c - Standby status after 9/1/60. d - 32 feet to 7/26/67.

Requests for additional information should be directed to the National Weather Service Office for which this summary was issued.

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A UNITED STATES DEPARTMENT OF COMMERCE PUBLICATION

LOCAL CLIMATOLOGICAL DATA
ANNUAL SUMMARY WITH COMPARATIVE DATA

DODGE CITY, KANSAS

1971

U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION ENVIRONMENTAL DATA SERVICE

NARRATIVE CLIMATOLOGICAL SUMMARY

The climate of Dodge City and southwestern Kansas is classified as semiarid. Dodge City is nearly 300 miles east of the Rocky Mountains, but the weather reflects the influence of the mountains. The mountains form a barricade against all except high level moisture from the southwest, west, and northwest. Chinook winds occur occasionally but with less frequency and effect than at stations farther to the west. Relatively dry air predominating with an abundance of sunshine contribute to broad diurnal temperature ranges.

The average annual precipitation accumulates to near 20 inches. Thunderstorms during the growing season contribute most of the moisture. In general, the thunderstorms are widely scattered, occurring during the late afternoons and evenings. They are occasionally accompanied by hail and strong winds, but due to the local nature of the storms, damage to crops and buildings is extremely spotted and variable. Winter is the dry season; however, the moisture accumulated during the winter months is important for the hard winter wheat. Accumulated snowfall averages near 20 inches for the winter, but duration of snow cover is generally brief due to mild temperatures and an abundance of sunshine. The exception results from the occasional blizzard that spreads across the flat treeless prairies of the high plains.

The extreme temperatures recorded for Dodge City range from 109° to -26°. Afternoon temperatures in the nineties prevail during the summer months; temperatures above 100° are the exception. Due to low humidity and a continual breeze, these temperatures are effectively moderated. Temperatures drop sharply after sunset, allowing cool comfortable nights. During the winter months, large temperature changes are frequent, but duration of extreme cold spells are brief. Temperatures below zero are infrequent and of only a few hours duration each winter.

The visibility at Dodge City is generally unrestricted as the terrain is favorable for unrestricted movement of air and airmasses. Periods of calm winds are rare as are extremely strong winds.

Western Kansas is noted for clear skies and abundance of sunshine with seldom a day the sun fails to shine.

The climate is conducive to the growing of hard winter wheat and maize. The winter wheat is pastured by cattle and sheep during the fall and winter. The semiarid climate favors production of wheat high in protein.

METEOROLOGICAL DATA FOR THE CURRENT YEAR

Station DODGE CITY, KANSAS MUNICIPAL AIRPORT Standard time used CENTRAL Latitude 37° 46' N Longitude 99° 58' W Elevation (ground) 2582 feet Year 1971

Month	Temperature: Averages: Daily maximum	Daily minimum	Monthly	Temperature: Extremes: Highest	Date	Lowest	Date	Degree days (Base 65°): Heating	Cooling	Precipitation: Total	Greatest in 24 hrs	Date	Snow, ice pellets: Total	Greatest in 24 hrs	Date	Relative humidity (Local time): Hour 00	Hour 06	Hour 12	Hour 18	Wind &: Resultant: Direction	Speed	Fastest mile: Average speed	Speed	# Direction	Date	Percent of possible sunshine	Average sky cover sunrise to sunset	Number of days: Sunrise to sunset: Clear	Partly cloudy	Cloudy	Precipitation .01 inch or more	Snow, Ice pellets .1.0 inch or more	Thunderstorms	Heavy fog	Temperatures: Maximum ‡: 90 and above	32 and below	Minimum: 32 and below	0 and below	Average daily solar radiation Langleys
JAN	37.8	16.6	27.2	72	29	-6	7+	1163	0	1.10	1.08	2-3	9.9	8.8	2-3	73	79	64	66	30	1.4	12.1	46	NW	3	63	6.3	10	5	16	3		2	1	3	0	13	30	5	252
FEB	41.5	22.3	31.9	65	15	0	8+	919	0	2.04	1.03	21	14.1	10.3	21	75	78	66	62	33	3.8	14.3	36	S	18	62	5.9	9	5	14	10		2	1	3	0	9	22	2	314
MAR	55.4	29.1	42.3	91	31	7	3+	701	2	0.69	0.67	14	0.1	0.1	2	64	74	49	41	30	1.5	15.0	63	NW	18	70	6.1	5	13	12	3		0	1	2	0	2	23	0	443
APR	67.2	39.9	53.6	80	10	21	6	337	1	1.09	0.87	19	T	T	5	63	73	47	43	15	1.8	13.0	43	W	13	64	5.5	9	9	12	5		2	0	1	0	0	5	0	516
MAY†	75.8	48.1	62.0	91	22+	32	12	142	53	2.81	0.93	29-30	0.0	0.0		71	78	50	45	16	1.9	13.8	52	NW	23	†72	4.9	13	10	8	9		0	2	0	0	0	3	0	632
JUN	90.5	63.6	77.1	103	24	53	1	0	369	3.93	1.27	2	0.0	0.0		65	76	44	41	18	9.4	14.0	52	SW	11	81	4.3	14	12	4	11		0	1	0	0	0	0	0	
JUL	90.8	64.6	77.7	106	13	53	30	2	404	4.49	1.64	29	0.0	0.0		63	76	44	36	16	5.0	11.7	55	N	22	80	5.1	11	10	10	8		0	1	0	0	0	0	0	
AUG	89.0	64.1	76.6	97	31	61	25+	0	366	0.89	0.64	6	0.0	0.0		68	80	46	43	17	8.5	10.7	27	SE	13+	78	5.5	6	16	7	5		0	1	0	0	0	0	0	
SEP	80.9	55.5	68.2	102	7	38	19	110	213	1.46	0.86	17	0.0	0.0		62	72	44	36	17	3.8	13.5	42	SW	30	74	4.1	15	6	9	5		0	0	1	0	0	0	0	
OCT	70.5	45.2	57.9	85	7	30	29	238	23	2.67	0.94	17-18	T	T		67	75	46	49	20	2.9	12.7	35	SW	1	75	3.8	16	10	5	8		0	0	1	0	0	0	0	
NOV	54.4	32.5	43.5	78	12	23	19+	639	0	3.75	2.42	16-17	1.0	0.9	22	71	76	56	60	22	2.7	12.8	36	NW	26+	62	5.0	13	7	10	5		0	1	1	0	0	3	0	
DEC	43.2	20.6	31.9	72	23	18	6	929	0	0.66	0.43	1-2	5.2	5.0	1-2	82	85	69	74	28	2.6	10.5	30	W	29	54	6.5	11	3	17	5		1	0	0	0	0	2	0	
YEAR	66.4	42.3	54.4	106	JUL. 13	-6	JAN. 7+	5180	1431	25.28	2.42	NOV. 16-17	30.9	10.3	FEB. 21	69	77	52	50	18	2.7	12.9	63	NW	MAR. 18	71	5.3	135	106	124	77	5	53	21	62	34	126	7	

† DATA CORRECTED AFTER PUBLICATION OF THE MONTHLY ISSUE.

Also correct Col. 18 of the May issue to 14.7 on the 31st, and to 316.3 for the month.

NORMALS, MEANS, AND EXTREMES

Month	Temperature: Normal: Daily maximum	Daily minimum	Monthly	Extremes Ø: Record highest	Year	Record lowest	Year	Normal heating degree days (Base 65°)	Precipitation: Normal total	Maximum monthly	Year	Minimum monthly	Year	Maximum in 24 hrs	Year	Snow, Ice pellets: Mean total	Maximum monthly	Year	Maximum in 24 hrs	Year	Relative humidity (Local time): Hour 00	Hour 06	Hour 12	Hour 18	Wind &: Mean speed	Prevailing direction	Fastest mile: Speed	# Direction	Year	Pct. of possible sunshine	Mean sky cover sunrise to sunset	Mean number of days: Sunrise to sunset: Clear	Partly cloudy	Cloudy	Precipitation .01 inch or more	Snow, Ice pellets .10 inch or more	Thunderstorms	Heavy fog	Temperatures: Max. 90 and above	32 and below	Min. 32 and below	0 and below	Average daily solar radiation Langleys
(a)	(b)	(b)	(b)	8		8		(b)	(b)	29		29		29		29	29		29		8	8	8	8	29	14	28	28		29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	
J	42.4	19.7	31.1	78	1967	-10	1966	1051	0.57	1.96	1949	T	1961	1.12	1945	4.0	10.3	1949	8.8	1971	72	77	58	59	13.8	S	56	NW	1950+	68	5.6	11	7	13	4	1	0	3	0	8	29	2	238
F	46.6	23.3	35.0	85	1970	-1	1965	840	0.70	2.04	1971	0.01	1970+	1.18	1948	3.4	14.1	1971	10.3	1971	71	77	57	53	14.3	N	72	NW	1953	64	5.7	9	7	12	5	1	1	3	0	5	25	1	319
M	54.3	29.3	41.8	91	1971	-1	1967	719	1.16	4.71	1957	0.02	1966	1.49	1970	5.3	24.0	1970	12.8	1970	65	73	48	43	16.0	N	74	NW	1952	67	5.9	9	9	13	2	1	0	3	0	3	22	0	421
A	66.1	41.1	53.6	92	1967	19	1970+	354	1.84	5.18	1952	0.07	1963	2.01	1952	0.6	5.6	1956	5.9	1970	64	73	44	39	15.8	SSE	70	N	1955	69	5.8	9	9	12	2	0	0	2	0	1	5	0	525
M	75.5	51.9	63.7	102	1967	26	1967	124	3.22	8.69	1951	0.68	1953	2.72	1965	T	T	1954+	T	1954+	67	77	47	43	15.0	S	71	W	1959	68	5.7	9	10	12	0	0	0	2	0	0	1	0	563
J	86.8	61.9	74.4	104	1968	42	1969	9	3.03	7.95	1951	0.12	1952	3.28	1944	0.0	0.0		0.0		69	61	48	43	14.8	S	73	S	1947	75	4.9	11	11	9	0	0	0	1	0	0	0	0	0	535
J	92.8	67.5	80.2	106	1971+	51	1970	0	2.31	9.13	1962	0.17	1946	4.17	1944	0.0	0.0		0.0		65	77	46	40	13.1	S	78	S	1951	78	4.8	12	12	7	0	0	0	0	0	0	0	0	0	628
A	91.7	66.6	79.2	107	1964	50	1967	0	2.36	6.31	1968	0.68	1970	3.08	1968	0.0	0.0		0.0		69	80	48	43	12.9	S	72	NW	1944	77	4.5	13	11	7	0	0	0	0	0	0	0	0	0	567
S	82.9	57.6	70.3	102	1971	36	1970	33	1.53	4.24	1962	0.01	1947	3.27	1959	T	T	1945	T	1945	74	83	52	48	14.1	S	73	NE	1962	76	4.3	15	7	8	0	0	0	0	0	0	0	0	446
O	71.1	45.5	58.3	96	1968	28	1969+	251	1.42	4.88	1968	T	1952	4.55	1968	0.1	1.5	1951	1.5	1951	67	75	45	48	13.7	S	63	SW	1949	75	4.2	15	8	8	0	0	0	0	0	0	0	0	363
N	55.1	30.4	42.8	81	1964	12	1964	666	0.64	3.75	1971	T	1966+	2.42	1971	2.0	13.2	1948	6.7	1948	73	79	54	58	13.9	S	59	NW	1948	69	5.0	12	8	10	4	1	1	2	0	0	0	0	264
D	45.8	23.6	34.7	74	1965	-7	1968	939	0.47	2.01	1965	T	1957+	0.95	1944	3.4	10.8	1942	6.6	1958	74	78	60	64	13.5	N	57	NW	1957	65	5.5	11	7	13	4	1	0	3	0	0	0	0	206
YR	67.6	43.2	55.4	107	AUG. 1964	-10	JAN. 1966	4986	19.25	9.13	JUL. 1962	T	NOV. 1966+	4.55	OCT. 1968	18.8	24.0	MAR. 1970	12.8	MAR. 1970	69	77	51	48	14.2	S	78	SW	JUL. 1951	71	5.1	136	106	123	77	6	54	23	53	24	126	3	433

Ø For period August 1963 through the current year.
Means and extremes above are from existing and comparable exposures. Annual extremes have been exceeded at other sites in the locality as follows: Highest temperature 109 in August 1936 and earlier; lowest temperature -26 in February 1899; maximum monthly precipitation 12.82 in May 1881; minimum monthly precipitation 0.00 in December 1889; maximum precipitation in 24 hours 6.03 in June 1899; maximum monthly snowfall 27.7 in February 1903; maximum snowfall in 24 hours 17.5 in March 1922.

(a) Length of record, years, based on January data. Other months may be for more or fewer years if there have been breaks in the record.
(b) Climatological standard normals (1931-1960).
° Less than one half.
+ Also on earlier dates, months, or years.
T Trace, an amount too small to measure.
Below zero temperatures are preceded by a minus sign.
The prevailing direction for wind in the Normals, Means, and Extremes table is from records through 1963.
‡ ≥ 70° at Alaskan stations.

Unless otherwise indicated, dimensional units used in this bulletin are: temperature in degrees F.; precipitation, including snowfall, in inches; wind movement in miles per hour, and relative humidity in percent. Heating degree day totals are the sums of negative departures of average daily temperatures from 65° F. Cooling degree day totals are the sums of positive departures of average daily temperatures from 65° F. Sleet was included in snowfall totals beginning with July 1948. The term "ice pellets" includes solid grains of ice (sleet) and particles consisting of snow pellets encased in a thin layer of ice. Heavy fog reduces visibility to 1/4 mile or less.

Sky cover is expressed in a range of 0 for no clouds or obscuring phenomena to 10 for complete sky cover. The number of clear days is based on average cloudiness 0-3, partly cloudy days 4-7, and cloudy days 8-10 tenths.

Solar radiation data are the averages of direct and diffuse radiation on a horizontal surface. The langley denotes one gram calorie per square centimeter.

& Figures instead of letters in a direction column indicate direction in tens of degrees from true North, i.e., 09 - East, 18 South, 27 - West, 36 - North, and 00 - Calm. Resultant wind is the vector sum of wind directions and speeds divided by the number of observations. If figures appear in the direction column under "Fastest mile" the corresponding speeds are fastest observed 1-minute values.

To 8 compass points only.

AVERAGE TEMPERATURE

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
#1932	26.3	41.4	38.6	54.5	66.0	73.0	82.7	79.4	68.8	54.5	41.8	28.0	54.6
1933	38.8	31.5	46.3	53.6	64.2	79.9	81.9	76.8	74.7	58.6	47.0	40.4	57.8
1934	34.7	35.8	43.9	56.2	69.5	80.0	87.3	82.8	69.6	62.4	47.4	35.4	58.6
1935	36.0	39.8	50.4	51.8	57.4	71.4	83.6	80.2	68.7	56.8	40.4	35.4	56.0
1936	28.4	23.6	48.3	54.7	67.4	76.6	83.8	83.6	70.5	55.8	43.4	37.9	55.9
1937	21.4	33.4	40.2	54.6	67.0	73.4	82.0	83.8	71.4	57.0	41.4	31.9	54.8
1938	35.4	37.8	49.6	53.1	63.1	73.2	80.8	83.6	71.7	63.6	41.5	35.6	57.4
1939	38.4	29.1	45.2	55.0	67.4	76.2	83.2	79.0	73.2	59.6	45.0	37.4	57.4
1940	16.6	35.2	48.6	53.5	65.8	73.0	82.0	75.8	70.2	63.4	49.8	37.8	54.8
1941	33.6	34.4	40.2	53.8	66.8	70.0	78.2	78.2	70.8	57.1	45.5	37.2	55.5
#1942	31.5	31.7	44.8	55.6	63.1	72.8	81.0	76.5	67.0	57.2	44.6	32.1	54.6
1943	33.3	41.1	38.6	57.8	59.8	75.5	82.0	82.8	67.2	55.3	42.6	28.2	55.4
1944	30.6	36.0	38.2	48.0	63.8	74.8	77.0	77.8	67.7	57.7	44.4	31.4	54.0
1945	37.4	34.1	49.0	50.7	61.8	66.6	77.4	78.4	68.9	57.2	46.2	28.9	54.7
1946	34.4	41.7	50.0	60.1	60.0	75.4	82.8	77.3	68.2	56.0	41.8	38.6	57.2
1947	32.0	31.8	38.6	50.3	59.8	71.0	77.8	81.8	74.0	64.9	37.4	32.2	54.3
1948	28.7	29.5	35.8	60.3	64.2	73.6	77.4	75.4	71.8	57.4	39.3	33.2	53.7
1949	21.6	32.2	41.8	53.6	64.0	73.8	78.8	75.6	69.6	57.0	50.1	34.2	54.0
1950	29.6	39.3	40.8	51.7	62.3	75.3	73.3	71.6	64.2	62.5	40.4	34.9	54.0
1951	28.8	37.7	38.7	49.9	63.2	67.3	77.6	78.4	65.1	54.3	38.6	32.2	52.7
1952	36.2	38.7	38.3	50.9	63.6	81.7	79.5	80.6	71.1	59.3	40.6	32.5	55.6
1953	39.1	38.9	47.8	50.7	63.2	80.9	77.9	76.3	72.0	60.7	41.5	34.5	57.1
1954	31.3	45.7	40.2	58.1	59.0	77.5	84.8	81.1	74.7	57.3	48.2	37.2	57.9
1955	33.3	29.8	47.2	59.0	65.7	69.9	81.5	79.5	70.7	60.0	39.3	32.6	55.3
1956	31.5	31.0	45.2	57.6	68.5	79.1	79.3	80.0	73.5	62.6	41.8	34.8	56.7
1957	25.0	39.8	40.7	50.7	68.0	72.7	81.5	79.0	69.7	54.9	39.5	40.6	54.1
1958	34.2	31.4	31.7	50.2	66.5	73.4	76.1	77.7	70.3	58.7	43.9	32.5	53.9
1959	26.4	33.7	43.4	52.6	65.1	76.2	76.1	81.3	68.9	53.1	38.5	37.3	54.4
1960	28.8	25.1	34.1	57.2	62.7	73.3	77.1	78.7	70.8	58.7	44.1	32.8	53.6
1961	33.2	37.7	43.5	51.4	62.3	72.6	77.5	75.6	64.1	57.2	38.8	30.4	53.7
1962	26.5	37.1	40.9	54.0	71.1	70.9	77.3	78.9	69.9	59.3	44.4	36.3	55.2
#1963	22.2	39.0	47.7	58.2	67.8	75.4	82.3	79.3	72.9	66.5	46.5	26.5	57.2
1964	35.5	31.8	40.8	56.8	69.0	73.7	83.1	77.4	68.2	57.2	43.8	32.9	55.7
1965	34.4	32.4	33.8	57.9	66.4	72.3	79.2	76.2	69.3	60.0	44.1	36.9	55.3
1966	25.3	30.9	48.0	51.2	64.7	75.9	84.2	74.2	67.0	56.9	43.1	24.9	54.2
1967	34.5	36.6	46.9	57.1	61.5	72.8	74.9	73.6	67.3	58.3	42.4	33.2	54.9
1968	32.1	33.4	48.1	54.9	59.3	74.5	77.8	78.3	69.0	59.6	40.8	28.4	54.7
1969	31.7	35.3	31.8	56.9	65.5	70.9	82.5	78.9	70.3	52.6	45.4	35.9	54.8
1970	30.0	40.8	36.5	52.7	68.2	73.7	80.8	81.6	68.2	51.3	41.7	34.4	55.2
1971	27.2	31.9	42.3	53.6	62.0	77.1	77.7	76.6	68.2	57.9	43.5	34.9	54.4
RECORD													
MEAN	30.1	34.1	42.4	54.0	63.5	73.5	78.9	77.6	69.2	57.1	42.8	33.2	54.7
MAX	41.9	46.4	55.6	67.7	75.6	85.7	91.2	89.9	81.8	70.1	55.6	44.8	67.1
MIN	18.2	21.8	29.1	41.0	51.4	61.2	66.5	65.2	56.5	44.0	30.0	21.6	42.2

TOTAL DEGREE DAYS

GOLF CITY, KANSAS

Season	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Total
1932-33	0	1	52	343	698	1148	810	937	581	347	140	0	5057
1933-34	0	3	8	208	540	764	876	816	654	280	48	0	4194
1934-35	0	8	100	123	529	916	898	707	451	398	268	24	4422
1935-36	0	12	66	281	738	918	1136	1201	527	358	60	10	5307
1936-37	0	0	94	362	647	842	1352	881	770	332	72	29	5381
1937-38	0	0	75	274	709	1026	908	761	479	370	136	1	4689
1938-39	0	0	18	148	708	879	825	1004	613	337	52	7	4581
1939-40	0	0	47	200	605	792	1497	858	604	364	86	9	5062
1940-41	3	0	55	104	725	844	973	853	769	338	53	17	4734
#1941-42	0	0	60	267	585	858	1035	932	629	298	168	20	4852
1942-43	0	0	99	268	610	1016	985	667	831	235	278	89	5028
1943-44	0	0	44	308	675	1143	1065	842	828	508	128	10	5551
1944-45	0	0	57	231	621	1042	1013	865	494	459	191	62	5035
1945-46	1	5	118	254	564	1120	953	654	476	171	189	40	4545
1946-47	0	13	64	299	694	821	1022	932	819	445	177	32	5318
1947-48	6	0	19	122	826	1018	1126	1031	965	173	175	7	5418
1948-49	0	0	34	253	761	988	1342	921	722	351	91	6	5473
1949-50	0	0	69	279	442	956	1089	714	744	423	137	12	4865
1950-51	0	16	53	131	731	925	1117	756	808	459	102	50	5148
1951-52	0	4	96	350	785	1013	893	758	819	420	105	0	5243
1952-53	1	0	25	307	729	1060	797	725	529	441	201	5	4820
1953-54	2	0	10	182	635	937	1036	535	761	226	221	10	4567
1954-55	0	0	15	299	498	853	974	976	703	214	54	29	4615
1955-56	0	0	63	190	765	999	1033	976	614	439	87	0	5166
1956-57	0	10	16	128	688	869	1229	696	749	429	148	19	4981
1957-58	0	0	55	331	757	748	948	937	1027	439	67	15	5324
1958-59	2	0	48	240	623	1003	1189	671	662	370	108	3	5119
1959-60	0	0	56	364	788	849	1112	1150	953	247	123	13	5655
1960-61	0	0	34	219	620	992	977	758	658	420	156	9	4841
1961-62	0	1	126	247	777	1065	1188	777	739	344	13	34	5311
1962-63	0	0	72	212	615	881	1321	722	539	219	77	5	4663
#1963-64	0	0	9	73	549	1180	911	956	742	272	75	14	4787
1964-65	0	3	81	254	632	1051	743	905	960	226	65	4	5124
1965-66	0	3	127	175	473	862	1221	948	521	405	116	5	4856
1966-67	0	5	54	273	651	1110	938	787	561	259	205	23	4868
1967-68	0	6	45	265	669	974	1015	908	526	305	215	4	4933
1968-69	0	1	17	225	718	1127	1028	826	1021	241	70	36	5310
1969-70	0	0	8	415	578	894	1079	672	878	382	58	33	4997
1970-71	4	0	85	441	696	880	1163	919	701	337	142	0	5368
1971-72	2	0	110	238	639	929							

TOTAL PRECIPITATION

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
#1932	1.28	0.37	0.91	1.08	1.20	4.46	2.38	2.80	2.35	0.71	0.15	0.22	17.71
1933	T	0.17	0.09	4.08	3.16	1.23	1.75	4.79	1.01	1.27	0.38	0.75	18.46
1934	0.29	1.69	0.52	0.42	1.00	2.34	0.43	0.24	2.05	1.50	0.99	0.13	11.40
1935	0.69	0.35	0.84	0.03	4.40	1.95	1.04	1.67	1.77	1.36	0.99	0.12	15.79
1936	0.59	0.06	0.10	0.55	5.81	1.31	1.10	0.98	1.81	1.00	T	0.85	14.17
1937	0.76	0.54	1.11	0.52	1.64	3.15	1.99	0.80	0.84	0.87	0.34	0.25	12.53
1938	0.01	1.08	1.63	3.20	4.30	1.50	1.71	2.96	2.73	0.18	0.07	0.06	19.43
1939	0.69	1.37	1.04	0.48	2.29	2.48	0.93	2.09	0.10	0.28	0.42	0.69	12.98
1940	0.50	0.59	1.31	3.54	4.41	3.53	1.52	5.09	2.05	0.12	2.39	0.79	25.84
1941	0.97	1.37	0.87	2.32	3.76	7.34	4.65	2.19	1.54	3.89	0.87	0.37	30.13
#1942	0.17	1.24	1.19	5.27	1.22	6.06	1.70	1.89	1.33	3.80	0.06	0.85	24.94
1943	0.13	0.24	0.34	1.30	1.13	4.34	0.25	2.62	0.83	2.51	0.04	0.85	14.58
1944	0.96	0.77	1.41	4.13	6.95	4.53	5.40	5.11	1.36	1.58	0.93	1.16	34.29
1945	1.48	0.97	0.13	3.84	1.56	3.19	3.04	3.42	2.59	1.17	0.01	0.54	21.93
1946	0.77	0.89	0.76	0.36	1.56	1.27	0.17	4.41	2.16	4.56	2.10	0.03	19.04
1947	0.74	0.04	1.54	3.59	4.01	3.53	2.17	1.15	0.01	0.56	1.37	1.01	29.14
1948	0.46	1.72	2.00	0.50	2.62	4.40	5.25	3.61	0.62	0.32	1.98	0.19	23.67
1949	1.95	1.01	1.55	2.95	4.85	3.30	1.80	2.57	0.55	4.48	0.01	0.41	29.44
1950	0.03	0.24	0.13	0.32	1.82	1.12	4.71	4.87	0.49	0.66	0.07	0.09	14.55
1951	0.55	0.84	0.90	1.56	8.69	7.95	5.42	2.17	2.66	1.33	0.63	0.02	32.76
1952	0.09	0.35	1.32	5.18	1.74	0.12	1.37	2.29	0.19	T	0.85	0.75	14.24
1953	0.15	0.15	1.14	1.04	0.68	1.99	1.18	1.62	0.65	0.89	1.27	0.75	11.46
1954	0.20	0.80	0.24	0.80	2.29	0.79	2.19	2.18	1.37	1.51	T	0.04	12.01
1955	0.30	0.54	0.19	0.79	7.99	2.18	1.79	0.78	2.47	0.07	0.07	0.01	17.42
1956	0.76	0.34	0.25	0.99	1.44	1.20	2.13	1.08	0.02	1.73	0.03	T	9.97
1957	0.25	0.17	4.71	1.00	3.74	4.38	3.29	1.87	3.79	0.71	0.98	T	25.46
1958	0.51	0.42	2.40	0.74	3.60	4.84	5.62	1.85	1.17	0.06	0.44	0.78	22.23
1959	0.30	0.48	1.54	0.37	4.36	2.03	1.78	0.91	3.86	3.30	0.15	0.77	20.09
1960	1.16	1.80	1.91	1.82	2.32	3.21	0.47	1.80	2.91	2.04	0.24	0.42	23.14
1961	T	0.31	1.32	0.99	2.82	4.06	3.41	4.57	0.41	1.78	1.42	0.23	21.34
1962	0.56	0.32	1.34	1.75	1.84	3.68	9.13	1.64	4.24	0.41	0.58	0.48	27.97
1963	0.56	0.10	0.66	3.07	2.88	2.19	2.27	1.22	1.86	0.65	0.08	0.84	12.97
1964	0.04	0.57	0.77	0.69	3.67	2.17	5.30	2.99	1.75	0.83	1.89	0.58	21.25
1965	0.49	0.60	0.15	0.83	5.65	4.76	3.37	1.62	2.63	3.04	T	2.01	24.95
1966	0.45	0.43	0.02	2.18	0.77	1.61	1.48	4.36	1.89	0.32	T	0.63	14.14
1967	0.32	0.01	0.14	1.54	2.24	5.49	5.06	3.16	2.38	0.21	0.14	0.51	21.30
1968	0.14	0.41	0.26	0.93	3.93	4.78	4.08	6.21	0.23	4.88	1.41	0.43	27.79
1969	0.03	1.77	2.31	1.39	2.83	0.75	2.17	4.21	1.40	1.66	0.04	0.19	18.79
1970	0.07	0.01	2.62	.91	0.81	1.18	1.72	0.68	2.64	0.52	0.05	0.04	12.26
1971	1.10	2.04	0.09	.09	2.61	3.93	4.49	0.99	1.46	2.87	3.75	1.06	25.28
RECORD MEAN	0.44	0.71	0.98	1.82	2.99	3.18	2.94	2.56	1.77	1.42	0.75	0.57	20.14

TOTAL SNOWFALL

Season	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Total
1932-33	0.0	0.0	0.0	T	0.5	1.1	0.0	0.8	0.6	T	0.0	0.0	3.0
1933-34	0.0	0.0	0.0	0.0	0.3	0.0	2.6	10.9	2.7	0.0	0.0	0.0	16.5
1934-35	0.0	0.0	0.0	0.0	3.4	0.2	0.4	1.4	0.5	0.0	0.0	0.0	5.9
1935-36	0.0	0.0	0.0	0.0	0.2	1.5	6.9	0.7	0.1	1.2	0.0	0.0	10.6
1936-37	0.0	0.0	0.0	0.0	T	3.9	2.9	6.4	4.4	0.0	0.0	0.0	18.5
1937-38	0.0	0.0	0.0	0.0	1.6	2.0	0.1	4.1	0.1	14.3	0.0	0.0	22.2
1938-39	0.0	0.0	0.0	0.0	0.2	1.2	0.8	14.3	2.8	T	0.0	0.0	19.3
1939-40	0.0	0.0	0.0	0.0	1.0	4.6	6.7	5.9	0.8	1.5	0.0	0.0	20.5
1940-41	0.0	0.0	0.0	0.0	2.5	5.9	1.3	7.5	8.8	0.9	0.0	0.0	26.5
#1941-42	0.0	0.0	0.0	4.0	5.3	3.3	1.9	12.2	2.4	T	0.0	0.0	29.1
1942-43	0.0	0.0	0.0	T	0.1	10.8	3.5	0.5	7.4	0.0	0.0	0.0	22.3
1943-44	0.0	0.0	0.0	0.0	T	10.5	3.6	7.0	5.4	T	0.0	0.0	26.5
1944-45	0.0	0.0	0.0	0.0	0.1	6.5	10.1	8.2	T	5.0	0.0	0.0	29.9
1945-46	0.0	0.0	T	T	T	3.8	2.1	T	1.0	0.0	0.0	0.0	6.9
1946-47	0.0	0.0	0.0	0.0	1.5	0.3	8.9	0.8	6.2	1.1	0.0	0.0	18.8
1947-48	0.0	0.0	0.0	0.0	5.3	4.7	8.3	4.4	17.9	0.0	0.0	0.0	40.6
1948-49	0.0	0.0	0.0	0.0	13.2	0.9	10.3	3.9	0.4	0.9	0.0	0.0	29.6
1949-50	0.0	0.0	0.0	0.0	0.0	4.3	T	T	1.0	0.1	0.0	0.0	5.4
1950-51	0.0	0.0	0.3	0.0	T	0.1	6.2	1.0	4.5	1.8	0.0	0.0	13.6
1951-52	0.0	0.0	0.3	1.9	6.1	0.9	1.8	2.5	11.7	T	0.0	0.0	24.1
1952-53	0.0	0.0	0.0	0.0	5.3	0.7	1.2	1.4	0.7	0.2	T	0.0	15.5
1953-54	0.0	0.0	0.0	0.0	4.2	0.4	2.3	2.4	T	0.0	T	0.0	9.3
1954-55	0.0	0.0	0.0	0.0	T	0.6	0.8	4.1	0.9	0.0	0.0	0.0	6.4
1955-56	0.0	0.0	0.0	0.0	0.6	0.2	8.6	3.5	2.5	5.6	0.0	0.0	21.0
1956-57	0.0	0.0	0.0	0.0	T	T	3.1	2.2	22.1	0.8	0.0	0.0	28.2
1957-58	0.0	0.0	0.0	T	3.8	T	3.4	2.8	10.3	0.0	0.0	0.0	20.3
1958-59	0.0	0.0	0.0	0.0	2.8	9.6	7.1	1.0	1.7	0.4	0.0	0.0	22.6
1959-60	0.0	0.0	0.0	0.0	1.0	3.6	5.8	11.9	10.8	0.0	0.0	0.0	33.1
1960-61	0.0	0.0	0.0	0.3	0.7	3.0	T	2.9	2.0	0.2	0.0	0.0	9.1
1961-62	0.0	0.0	0.0	0.0	3.2	1.4	3.4	T	0.4	0.0	0.0	0.0	8.4
1962-63	0.0	0.0	0.0	0.0	0.4	4.3	0.7	0.4	0.3	T	0.0	0.0	5.7
1963-64	0.0	0.0	0.0	0.0	7.0	0.4	3.3	2.6	0.0	0.0	0.0	0.0	13.3
1964-65	0.0	0.0	0.0	0.0	2.9	5.4	4.9	5.5	0.3	0.0	0.0	0.0	18.6
1965-66	0.0	0.0	0.0	0.0	0.0	9.1	4.7	1.1	0.2	T	0.0	0.0	15.1
1966-67	0.0	0.0	0.0	0.0	T	8.2	4.1	0.1	0.6	0.0	0.0	0.0	13.0
1967-68	0.0	0.0	0.0	T	1.0	2.9	0.2	3.7	0.3	T	0.0	0.0	8.1
1968-69	0.0	0.0	0.0	0.0	T	2.6	T	8.9	19.4	0.0	0.0	0.0	30.9
1969-70	0.0	0.0	0.0	0.0	0.1	0.3	0.5	T	24.0	1.8	0.0	0.0	26.7
1970-71	0.0	0.0	0.0	1.1	T	T	9.9	14.1	0.1	T	0.0	0.0	25.2
1971-72	0.0	0.0	0.0	T	1.6	5.2							

Record mean values above (not adjusted for instrument location changes listed in the Station Location table) are means for the period beginning in 1875.

# Indicates a break in the data sequence during the year, or season, due to a station move or relocation of instruments. See Station Location table.

STATION LOCATION

DODGE CITY, KANSAS

Location	Occupied from	Occupied to	Airline distance and direction from previous location	Latitude North	Longitude West	Elevation above See level	Elevation above Ground								Elevation above See level	Remarks
						Ground at temperature site	Wind instruments	Extreme thermometers	Psychrometer	Telepsychrometer	Tipping bucket rain gage	Weighing rain gage	8" rain gage	Hygrothermometer	Pyranometer	
COOPERATIVE																
Fort Dodge	6/?/66	10/?/77		37° 44'	99° 54'	2430										Temperature, wind, clouds, precipitation. Closing date doubtful.
Fort Dodge	11/?/67	2/?/71		37° 44'	99° 54'	2430										Temperature and precipitation.
Fort Dodge	11/?/76	10/?/77		37° 44'	99° 54'	2430										Temperature and precipitation.
Dodge City	8/?/88	12/?/88	7 mi. WSW	37° 45'	100° 01'	2485										
CITY																
Old Dodge House Chestnut & Railroad Ave.	9/15/74	6/4/76		37° 45'	100° 01'	2485	30	16	16				on roof			Temperature and precipitation.
Lake Building, Walnut St. & Second Ave., 2nd Floor	6/5/76	12/31/82	600 ft.WSW	37° 45'	100° 01'	2491	36	15	15				30			
Hoover Block, 108 Front Street	1/1/83	8/31/86	500 ft. SE	37° 45'	100° 01'	2485	47	16	16				41			Forced to move by fire.
Beeson Block, Front St.	9/1/86	11/21/09	100 ft. W	37° 45'	100° 01'	2485	a55	44	44		47		36			Wind speeds diminished from fall of 1907 due to new buildings. a - 55 feet to 1894 and 52 feet to 10/7/02.
Weather Bureau Building Central and Spruce	11/22/09	4/6/31	900 ft. NE	37° 45'	100° 01'	2522	51	11	11		3		3			Wind speed from north reduced by buildings and trees, 1927-1931.
First National Bank Building, Second & Spruce Streets	4/7/31	5/30/32	750 ft. W	37° 45'	100° 01'	2504	100	88	88		81		81			Temporary quarters while Federal Building under construction.
Federal Building 2nd Floor Central Street & Spruce Avenue	5/21/32	6/30/42	750 ft. E	37° 45'	100° 01'	2522	86	10	10		3	3	3			
AIRPORT																
2nd Floor ** Administration Building Municipal Airport	7/1/42	Present	2.9 mi. E	37° 46'	99° 58'	d2582	a20	b4	b4			5	4	c5	2625	a - 58 feet to 4/12/61. b - 5 feet to 8/1/63. c - Commissioned 8/1/63 on site 1295 feet NE of thermometer shelter. d - 2594 feet to 8/1/63.
** Office moved to 1st Floor 4/10/61.																

Requests for additional information should be directed to the National Weather Service Office for which this summary was issued.

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U.S. DEPARTMENT OF COMMERCE
NATIONAL CLIMATIC CENTER
FEDERAL BUILDING
ASHEVILLE, N.C. 28801

A UNITED STATES DEPARTMENT OF COMMERCE PUBLICATION

LOCAL CLIMATOLOGICAL DATA
ANNUAL SUMMARY WITH COMPARATIVE DATA

AMARILLO, TEXAS

1971

U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION ENVIRONMENTAL DATA SERVICE

NARRATIVE CLIMATOLOGICAL SUMMARY

The station is located 7 statute miles ENE of the downtown post office in a region of rather flat topography. The Canadian River flows eastward 18 miles north of the station, with its bed about 800 feet below the plains. The Prairie Dog Town Fork of the Red River flows southeastward about 15 miles south of the station where it enters the Palo Duro Canyon, which is about 1,000 feet deep. There are numerous shallow lakes, often dry, over the area and the nearly treeless grasslands slope gradually downward to the east. The terrain gradually rises to the west and northwest. To the east, south, and west most of the land is under cultivation with considerable irrigation; while to the northwest, north, and northeast grazing land predominates. Soil of the area is chestnut loam interspersed with gray and red loams, all overlying a substratum of caliche.

Departures from normal precipitation are wide, with yearly totals ranging from 9.94 inches in 1956 to 39.75 inches in 1923. A period of 5 consecutive years, 1952-56, with significantly below normal rainfall resulted in the most severe drought of record. Three-fourths of the total annual precipitation falls between April and September, occurring from thunderstorm activity. The average frequency of precipitation amounts include annually: 53 days with a trace, 11 days .50 or more, 4 days 1.00 inch or more, and 1 day 2.00 inches or more. An even snow cover is very unusual because of high winds, but winter snowfall averages 13.4 inches ranging from 0.1 inch in 1949-50 up to 48.7 in 1918-19. Snow usually melts within a few days after it falls. Heavier snowfalls of 10 inches or more, usually with near blizzard conditions, have occurred 20 times in 72 years, mostly over a 2-3-day period. The heaviest, 20.6 inches, occurred March 25-26, 1934, in 23 hours, but much of it melted as it fell, and the greatest depth on the ground reached only 4.5 inches. The record greatest snow depth on ground was 16.5 inches February 26, 1903, when 17.5 inches fell in 49 hours. The most damaging blizzard occurred March 23-25, 1957, when 11.1 inches of snow fell, reached a depth of 10 inches, and northerly winds averaging 40 m.p.h. for 24 hours, with gusts over 50 m.p.h., produced severe drifting.

The Amarillo area is subject to rapid and large temperature changes, especially during the winter months, when cold fronts from the northern Rocky Mountain and Plains states sweep across the level plains at speeds up to 40 m.p.h. Temperature drops of from 50 to 60 degrees within a 12-hour period are not uncommon in association with these fronts, and 40-degree drops have occurred within a few minutes. Normally, the coldest period occurs in mid-January, however, the record minimum temperature, -16 degrees, occurred February 12, 1899. Long term records of 0 degrees, or lower, average less than 2 days per year. Normally the warmest period occurs in July, but the record maximum temperature of 108 degrees occurred June 24, 1953. Temperatures 100 degrees, or higher, average 6 days per year, slightly more frequent in July than June or August. Usually there is low humidity and sufficient wind to prevent the high daytime temperatures from being particularly uncomfortable, and rapid cooling occurs at night.

The treeless plains of the area, absence of sheltering mountain ranges, and nearness to the paths of moving pressure systems tend to cause strong winds, with March and April having the strongest winds. Light winter precipitation makes the spring season favorable for wind erosion and resultant duststorms that occasionally reduce visibility to less than 1 mile. With improved tillage methods and increasing irrigation, duststorms have been infrequent in recent years. The fastest winds recorded have been in connection with thunderstorms, occasionally accompanied by hail and wind damage; 84 m.p.h. was recorded May 15, 1949, when a tornado moving northeastward passed about a mile west of the station. The wind is below 15 m.p.h. 63 percent of the time.

Humidity averages rather low, frequently dropping below 20 percent and occasionally below 4 percent in the spring. Low humidity moderates the effect of high summer afternoon temperatures, permits evaporative cooling systems to be very effective, and makes for pleasant evenings and nights.

Abundant sunshine and adequate growing season permit a broad variety of agriculture and gardening. The average freeze-free period (above 32 degrees) is 198 days, but has ranged from 164 days, 1909 and 1917, to 242 days in 1963. The latest spring freeze has ranged from March 14, 1963, to May 7, 1915, and 1917, with April 16 as the average (median) date. The earliest autumn freeze has ranged from September 25, 1926, to November 21, 1934, with October 31 the average (median) date.

Severe local storms are infrequent, though a few thunderstorms, with damaging hail, lightning, and wind in a very localized area, occur most years, usually in spring and summer. These storms are often accompanied by very heavy rain, which produces local flooding, particularly of roads and streets. Tornadoes are rare, one of record moving through the city of Amarillo late Sunday afternoon, May 15, 1949, causing 6 deaths and 87 injuries, with damage estimated at $4,800,000. In the county-wide area 10 tornadoes have been recorded in 70 years.

METEOROLOGICAL DATA FOR THE CURRENT YEAR

Station: AMARILLO, TEXAS — AMARILLO AIR TERMINAL — Standard time used: CENTRAL — Latitude: 35° 14' N — Longitude: 101° 42' W — Elevation: ground 3604 feet — Year: 1971

Month	Temperature: Averages: Daily maximum	Daily minimum	Monthly	Extremes: Highest	Date	Lowest	Date	Degree days (Base 65°): Heating	Cooling	Precipitation: Total	Greatest in 24 hrs.	Date	Snow, ice pellets: Total	Greatest in 24 hrs.	Date	Relative humidity: Hour 00 (local time)	Hour 06	Hour 12	Hour 18	Resultant: Direction	Speed	Average speed	Fastest mile: Speed	Direction	#	Date	Percent of possible sunshine	Average sky cover sunrise to sunset	Number of days: Sunrise to sunset: Clear	Partly cloudy	Cloudy	Precipitation .01 inch or more	Snow, ice pellets 1.0 inch or more	Thunderstorms	Heavy fog	Temperatures: Maximum ‡ 90° and above	32° and below	Minimum 32° and below	0° and below	Average daily solar radiation - langleys
JAN	52.7	22.8	37.8	76	20	-4	5	837	0	0.10	0.10	2-3	0.8	0.8	3	54	61	41	38	27	3.0	13.2	34	N	13	74	5.0	14	4	13	2	0	0	3	0	24	3	3
FEB	52.4	25.2	38.8	76	15	0	7	726	0	1.65	1.28	20-21	17.3	13.5	20-21	59	67	45	36	27	3.2	16.6	43	N	21	74	4.4	13	8	7	5	4	0	3	0	22	1	1
MAR	64.9	31.7	48.3	94	27	10	3	524	13	0.10	0.10	2	1.0	1.0	2	40	54	30	19	22	5.9	17.6	43	NW	18+	85	4.2	16	8	7	1	0	0	3	0	17	0	0
APR	70.7	40.6	55.7	93	12	24	6	290	18	0.77	0.46	15	T	T	5	48	62	32	28	19	6.4	16.9	47	NE	13	84	4.1	16	7	7	2	0	0	1	1	17	0	0
MAY	80.1	49.6	64.9	95	16	33	19	89	94	0.91	0.39	26-27	0.0	0.0		47	62	32	25	19	6.6	17.2	42	SE	29+	85	3.8	16	7	8	6	2	0	0	2	4	0	0
JUN	89.6	62.1	75.9	94	24+	50	1	0	334	4.17	1.15	30	0.0	0.0		55	69	37	31	18	12.2	16.1	54	SW	5	86	3.8	16	8	6	10	0	1	1	18	0	0	0
JUL	88.7	65.1	76.9	100	6	54	31	1	381	1.79	1.35	30-1	0.0	0.0		54	66	40	34	19	5.9	12.9	34	SE	27	85	4.0	12	10	9	9	0	9	0	18	0	0	0
AUG	82.8	61.6	72.2	92	21	58	7+	0	232	3.33	1.20	17	0.0	0.0		72	81	51	46	18	8.9	11.6	33	SE	10	83	5.0	13	7	11	10	0	13	2	2	0	0	0
SEP	78.6	55.5	67.1	95	6	39	20	120	189	4.70	2.52	21-22	0.0	0.0		62	72	47	43	18	5.1	15.2	32	NE	17	74	3.8	18	4	8	6	0	4	3	7	0	0	0
OCT	69.3	45.0	57.2	86	15	31	29	245	10	2.59	1.52	17-18	0.0	0.0		64	69	44	45	21	5.7	13.3	37	W	30+	75	3.8	18	5	8	8	0	2	3	0	0	1	0	0
NOV	57.6	33.5	45.6	80	12	24	19	573	0	2.08	1.29	16-17	T	T	30	64	71	48	51	22	4.3	13.3	38	W	1	68	4.6	15	6	9	5	0	3	3	0	1	14	0	0
DEC	47.9	27.2	37.6	75	23	15	6	843	0	0.89	0.80	1-2	7.9	7.4	1-2	75	77	59	63	24	4.3	12.9	36	W	23	56	5.7	13	1	17	5	2	0	9	0	6	26	0	0
YEAR	69.6	43.3	56.5	100	JUL. 6	-4	JAN. 5	4250	1271	23.04	2.52	SEP. 21-22	27.0	13.5	FEB. 20-21	58	68	42	38	20	5.3	14.7	54	SW	JUN. 5	78	4.4	180	75	110	69	7	52	32	53	17	128	4	

NORMALS, MEANS, AND EXTREMES

Month	Temperature: Normal: Daily maximum	Daily minimum	Monthly	Extremes: Record highest	Year	Record lowest	Year	Normal heating degree days (Base 65°)	Precipitation: Normal total	Snow, ice pellets: Maximum monthly	Year	Minimum monthly	Year	Maximum in 24 hrs	Year	Snow, ice pellets: Mean total	Maximum monthly	Year	Maximum in 24 hrs	Year	Relative humidity: Hour 00 (Local time)	Hour 06	Hour 12	Hour 18	Wind &: Mean speed	Prevailing direction	#	Fastest mile: Speed	Direction	#	Year	Pct. of possible sunshine	Mean sky cover sunrise to sunset	Mean number of days: Sunrise to sunset: Clear	Partly cloudy	Cloudy	Precipitation .01 inch or more	Snow, ice pellets 1.0 inch or more	Thunderstorms	Heavy fog	Temperatures: Max ‡ 90° and above	Max 32° and below	Min 32° and below	Min 0° and below	Average daily solar radiation - langleys
(a)	(b)	(b)	(b)	11		11		(b)	(b)	31		31		31		30	31		31		10	10	10	10	30	15	31	31		30	30	30	30	30	30	30	30	30	10	10	10	10	
J	49.8	23.5	36.7	79	1970+	-9	1963	877	0.65	2.33	1968	T	1967+	1.74	1968						62	69	47	43	13.2	SW		62	NE	1953	69	5.1	13	7	11	4	1	0	3	27	2	
F	54.9	27.6	41.3	88	1963	0	1971	664	0.62	1.83	1948	T	1943	1.28	1971	3.4	12.9	1960	6.7	1960	62	72	49	40	14.3	SW		70	NW	1956	68	5.2	11	7	10	4	1	1	4	22	8	
M	62.4	32.7	47.6	94	1971	7	1967	546	0.82	2.82	1957	T	1950+	1.10	1970	2.9	14.7	1961	9.8	1957	55	66	40	32	15.5	SW		72	W	1950	71	5.2	12	8	11	5	1	1	3	17	0	
A	72.0	43.0	57.5	98	1965	24	1971	252	1.32	3.74	1942	T	1964	1.57	1962	0.4	6.4	1947	5.1	1947	52	65	35	28	15.4	SW		74	SW	1942	72	5.0	11	9	10	5	0	1	2	2	0	
M	80.1	52.9	66.5	99	1964+	30	1970	56	3.37	9.81	1951	0.19	1966	6.75	1951	T	T	1953	T	1953	56	69	38	32	14.8	S		84	SW	1949	72	5.1	11	10	10	8	0	2	7	0	0	
J	91.0	62.9	77.0	104	1970+	43	1970+	0	2.89	10.73	1965	0.01	1953	6.15	1960						63	77	45	39	14.4	S		65	S	1953	76	4.4	13	11	6	8	0	0	1	12	0	0	0	
J	94.2	67.0	80.6	104	1970+	54	1971	0	2.34	7.59	1960	0.12	1948	4.09	1943	0.0	0.0		0.0		59	72	41	37	12.4	S		66	SW	1948	77	4.5	13	12	6	8	0	0	0	0	0	
A	93.0	66.0	79.5	104	1964	52	1966	0	2.58	5.69	1964	0.39	1947	4.26	1945	0.0	0.0		0.0		64	75	45	42	11.8	S		65	E	1946	77	4.2	15	10	6	8	0	0	0	0	0	
S	85.4	58.2	71.8	100	1970	36	1970	18	1.89	5.02	1950	0.24	1947	3.42	1941	T	T	1949	T	1945	71	80	50	46	13.1	S		68	NE	1942	75	3.8	17	6	7	5	0	0	4	2	0	
O	74.7	46.2	60.5	94	1968	25	1970	205	1.76	7.64	1941	0.00	1952	3.45	1948	0.1	3.9	1970	2.9	1970	80	89	40	38	13.0	SW		68	S	1949	74	3.8	17	7	7	5	0	0	2	2	0	
N	63.1	31.8	46.0	82	1966	15	1961	570	0.66	2.26	1951	T	1960+	1.29	1971	1.4	13.6	1952	12.2	1952	63	71	45	46	13.2	SW		59	NW	1970	73	4.2	15	7	8	3	0	1	2	0	0	
D	52.2	26.3	39.3	76	1965+	-3	1961	797	0.77	4.52	1959	T	1970+	3.11	1943	2.5	8.5	1949	7.4	1971	84	70	49	49	13.0	SW		62	NE	1953	67	4.8	13	7	11	4	1	0	3	0	3	26	0	
YR	72.5	44.8	58.7	104	JUL. 1970+	-9	JAN. 1963	3985	19.67	10.73	JUN. 1965	0.00	OCT. 1952	6.75	MAY 1951	14.2	17.3	FEB. 1971+	13.5	FEB. 1971	61	71	44	39	13.7	SW		84	SW	MAY 1949	73	4.6	101	101	103	67	4	48	25	69	11	157	2	

Means and extremes above are from existing and comparable exposures. Annual extremes have been exceeded at other sites in the locality as follows: Highest temperature 108 in June 1953; lowest temperature -16 in February 1899; maximum monthly snowfall 28.7 in February 1903; maximum snowfall in 24 hours 20.6 in March 1934.

(a) Length of record, years, based on January data. Other months may be for more or fewer years if there have been breaks in the record.
(b) Climatological standard normals (1931-1960).
° Less than one half.
+ Also on earlier dates, months, or years.
T Trace, an amount too small to measure.
Below zero temperatures are preceded by a minus sign.
The prevailing direction for wind in the Normals, Means, and Extremes table is from records through 1963.
‡ ≥ 70° at Alaskan stations.

Unless otherwise indicated, dimensional units used in this bulletin are: temperature in degrees F.; precipitation, including snowfall, in inches; wind movement in miles per hour; and relative humidity in percent. Heating degree day totals are the sums of negative departures of average daily temperatures from 65° F. Cooling degree day totals are the sums of positive departures of average daily temperatures from 65° F. Sleet was included in snowfall totals beginning with July 1948. The term "ice pellets" includes solid grains of ice (sleet) and particles consisting of snow pellets encased in a thin layer of ice. Heavy fog reduces visibility to 1/4 mile or less.

Sky cover is expressed in a range of 0 for no clouds or obscuring phenomena to 10 for complete sky cover. The number of clear days is based on average cloudiness 0-3, partly cloudy days 4-7, and cloudy days 8-10 tenths.

Solar radiation data are the averages of direct and diffuse radiation on a horizontal surface. The langley denotes one gram calorie per square centimeter.

& Figures instead of letters in a direction column indicate direction in tens of degrees from true North; i.e., 09 - East, 18 - South, 27 - West, 36 - North, and 00 - Calm. Resultant wind is the vector sum of wind directions and speeds divided by the number of observations. If figures appear in the direction column under "Fastest mile" the corresponding speeds are fastest observed 1-minute values.

To 8 compass points only.

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AVERAGE TEMPERATURE

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1932	39.2	49.1	44.0	59.0	67.3	72.6	80.2	78.0	68.9	58.3	47.1	30.7	57.5
1933	43.8	36.2	50.8	55.8	66.5	79.2	82.3	77.2	73.7	62.4	50.4	47.4	60.7
1934	41.9	42.4	49.1	60.8	68.9	79.6	84.1	81.4	70.1	66.0	51.2	42.0	61.4
1935	44.2	43.1	53.1	56.8	66.9	74.4	80.1	79.2	67.6	61.8	46.2	39.5	58.9
1936	39.6	33.5	52.2	58.0	67.9	77.5	80.6	81.9	69.2	56.3	48.5	42.9	58.4
1937	30.8	40.4	44.2	57.5	67.4	74.4	81.0	82.1	73.1	61.8	47.6	40.0	58.4
1938	40.8	42.9	52.8	56.4	69.9	75.0	79.2	81.6	73.6	64.8	49.6	41.9	60.1
1939	41.9	35.4	51.4	58.7	67.6	76.0	80.6	77.7	75.8	63.0	48.3	44.0	60.0
1940	29.3	41.2	50.7	57.0	64.8	73.4	82.0	76.8	72.7	64.8	44.1	42.5	58.4
#1941	39.4	40.4	49.2	59.3	64.1	70.4	75.3	75.8	69.2	58.2	47.6	39.6	56.6
1942	34.8	36.2	44.0	56.2	63.5	74.4	78.6	75.4	66.5	56.8	49.2	38.0	56.2
1943	37.6	44.0	49.8	60.8	62.7	76.2	78.2	81.8	69.0	57.6	44.4	32.3	57.3
1944	39.2	39.6	44.2	52.7	65.2	75.5	77.1	79.0	69.0	58.8	47.2	35.0	56.3
1945	37.8	40.6	50.6	51.2	66.0	72.6	77.2	77.4	69.8	58.6	49.0	36.4	57.3
1946	34.7	42.6	50.9	63.0	62.4	74.8	80.5	78.0	68.5	59.2	45.0	43.2	58.6
1947	39.8	39.2	42.2	57.8	62.8	73.2	78.2	79.0	74.0	64.4	40.8	38.1	58.4
1948	31.0	34.0	40.2	61.4	65.8	75.6	78.9	76.2	70.6	58.5	42.4	40.6	56.2
1949	26.7	39.2	46.7	53.8	64.8	73.6	78.2	75.0	68.7	57.8	52.8	38.4	56.3
1950	39.4	45.9	46.9	56.0	69.9	75.8	74.3	73.7	67.0	64.7	46.0	39.8	57.9
1951	34.8	41.0	44.8	53.7	64.9	72.2	81.1	79.7	70.0	59.0	42.9	38.4	56.9
1952	41.5	42.6	45.0	54.4	65.0	80.2	78.4	81.7	69.9	57.9	42.5	37.0	58.0
1953	44.7	40.3	52.9	54.6	69.4	83.3	80.2	77.1	72.8	60.5	47.9	36.4	59.7
1954	39.8	48.6	45.6	61.4	61.1	76.6	83.1	79.9	75.3	61.1	50.5	42.3	60.5
1955	37.7	37.6	47.7	59.4	69.7	71.7	77.4	76.7	70.4	59.8	43.4	41.2	57.4
1956	37.5	35.3	47.5	53.8	70.1	78.0	77.5	77.2	73.0	62.7	43.7	42.1	58.2
1957	36.6	46.4	45.0	52.4	60.7	72.3	81.2	77.1	68.4	56.0	40.7	42.7	56.4
1958	38.8	37.7	37.0	51.1	66.7	76.0	78.0	78.2	70.5	59.1	46.7	37.3	56.2
1959	32.3	39.2	48.9	55.0	66.0	74.6	75.5	78.4	70.2	56.8	42.4	40.3	56.2
1960	31.4	31.4	42.3	58.3	69.1	74.3	79.5	76.2	69.5	58.0	47.1	34.9	55.4
#1961	34.6	39.3	48.5	56.2	67.3	73.9	76.4	77.2	67.6	59.5	41.3	36.5	56.5
1962	31.7	45.5	46.7	57.2	71.7	72.4	78.0	78.3	70.4	61.5	47.8	40.9	58.5
1963	28.9	41.7	50.4	61.8	69.0	74.1	81.3	77.8	72.3	66.2	49.5	32.5	58.8
1964	37.2	32.1	44.8	57.9	68.9	76.5	81.9	78.1	69.6	60.2	47.5	39.1	57.9
1965	41.0	37.9	38.4	59.4	66.9	72.1	78.6	76.9	68.4	59.5	52.5	42.9	57.6
1966	27.8	34.1	50.0	54.5	66.0	74.2	82.9	73.5	68.5	57.7	51.6	35.5	56.3
1967	40.7	40.6	53.4	60.6	69.4	73.7	77.2	75.0	68.3	60.9	46.6	35.4	58.0
1968	38.3	38.0	48.7	55.3	69.4	74.9	77.0	77.0	69.1	62.1	45.4	36.9	57.2
1969	41.4	40.4	38.8	59.9	67.2	72.8	82.6	80.2	71.1	54.5	46.7	38.4	57.8
1970	35.2	43.2	41.7	56.0	68.8	74.5	80.7	79.1	70.9	56.0	48.6	43.4	57.7
1971	37.8	38.4	48.3	55.7	64.9	75.9	76.9	72.2	67.1	57.2	45.6	37.6	56.5
RECORD MEAN	36.6	39.2	46.9	56.3	64.9	74.1	77.9	76.9	69.9	58.9	46.6	38.1	57.2
MAX	49.3	52.2	60.7	70.1	77.8	86.0	90.1	89.1	82.4	71.8	59.5	50.1	70.0
MIN	23.9	26.1	33.0	42.4	51.9	61.2	65.7	64.6	57.3	46.0	33.6	26.0	44.3

TOTAL DEGREE DAYS

AMARILLO, TEXAS

Season	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Total
1932-33	0	3	64	223	538	1061	658	787	438	282	72	0	4124
1933-34	0	0	0	108	435	947	744	633	490	158	67	0	3182
1934-35	0	1	36	59	417	712	645	607	360	256	202	13	3314
1935-36	0	4	64	165	560	790	910	913	394	268	49	1	4118
1936-37	0	0	88	296	559	886	1061	688	644	295	46	16	4339
1937-38	0	0	18	164	526	775	750	618	373	282	80	0	3586
1938-39	0	0	1	95	586	719	717	825	424	236	91	1	3655
1939-40	0	0	13	116	501	649	1107	692	453	269	57	7	3864
#1940-41	0	0	13	83	626	700	797	675	674	294	91	8	3961
1941-42	0	0	47	230	523	788	936	790	648	279	146	12	4399
1942-43	0	0	67	266	475	837	852	582	661	153	173	149	4215
1943-44	0	0	24	239	619	1019	922	739	644	368	87	1	4658
1944-45	3	1	35	193	537	930	843	683	448	414	116	13	4216
1945-46	1	4	93	207	477	891	937	627	441	104	192	20	3934
1946-47	0	4	64	209	599	678	912	830	707	374	129	12	4518
1947-48	0	0	11	104	727	835	1049	895	765	146	90	0	4622
1948-49	0	0	39	221	675	756	1184	724	567	340	70	0	4576
1949-50	3	1	31	262	367	827	788	526	555	288	74	13	3732
1950-51	0	7	23	61	565	764	928	667	617	349	96	29	4106
1951-52	0	0	52	231	653	817	720	643	613	316	99	0	4146
1952-53	0	0	25	226	667	859	623	686	366	319	120	0	3941
1953-54	0	0	12	179	505	881	775	450	594	147	173	5	3721
1954-55	0	0	0	202	428	698	841	761	531	204	66	27	3758
1955-56	0	0	32	180	641	731	844	851	540	339	24	0	4182
1956-57	0	0	7	127	634	702	871	515	616	381	140	26	4028
1957-58	0	0	49	303	721	683	867	756	861	412	66	5	4721
1958-59	0	0	37	233	546	852	1008	716	534	321	74	3	4374
1959-60	0	0	46	311	671	758	1033	965	696	214	80	0	4774
#1960-61	3	0	27	210	530	929	935	714	507	303	54	7	4219
1961-62	0	0	63	189	702	879	1026	540	563	254	23	15	4254
1962-63	0	0	23	159	508	741	1114	648	450	139	61	7	3850
1963-64	0	0	11	42	458	1000	855	949	618	235	53	7	4228
1964-65	0	0	48	149	517	795	740	762	820	194	56	7	4088
1965-66	0	0	73	191	376	676	1143	857	458	312	99	1	4186
1966-67	0	23	22	250	395	908	743	675	356	159	135	9	3675
1967-68	0	1	23	189	544	911	820	777	504	290	109	0	4164
1968-69	0	0	6	159	583	865	726	681	808	176	69	24	4097
1969-70	0	0	1	374	543	817	981	602	713	280	50	33	4394
1970-71	0	0	47	359	544	661	837	726	524	290	89	0	4077
1971-72	1	0	120	245	575	843							

TOTAL PRECIPITATION

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1932	1.60	0.41	0.42	2.21	1.02	9.24	1.22	0.70	2.79	0.64	0.02	0.87	21.14
1933	0.02	0.29	0.56	0.64	2.01	0.05	0.64	6.02	0.88	0.49	0.58	0.02	12.22
1934	0.09	0.09	2.83	0.77	3.21	1.94	0.19	1.51	0.96	3.21	1.13	0.40	13.33
1935	0.75	0.22	1.14	0.05	2.57	0.28	0.81	5.32	2.03	0.87	1.27	0.18	15.49
1936	1.02	0.25	T	0.25	9.02	0.84	0.51	1.39	4.74	0.82	T	0.88	19.72
1937	0.29	0.18	1.10	0.39	6.83	2.83	1.49	0.64	2.31	0.31	0.14	0.29	17.10
1938	0.18	2.87	1.24	1.07	4.03	2.49	1.88	0.15	1.62	3.36	0.43	0.08	19.10
1939	2.31	0.17	0.25	2.30	1.75	7.39	0.57	3.28	0.45	1.10	0.06	0.98	21.01
1940	0.52	0.88	0.24	1.10	2.68	1.64	0.88	0.71	0.54	0.29	3.87	0.27	13.62
#1941	0.40	0.94	2.55	1.29	7.47	5.07	3.36	3.18	4.30	7.64	0.33	0.68	37.21
1942	0.06	0.63	0.42	3.74	0.91	2.29	0.00	3.95	1.45	0.18	T	1.19	21.62
1943	0.08	T	0.01	1.06	1.82	1.01	6.64	2.09	0.79	0.72	0.39	3.77	18.38
1944	1.67	0.72	T	1.83	3.72	4.33	5.06	1.40	2.08	0.84	0.75	1.20	23.60
1945	0.77	0.24	0.41	1.58	0.42	1.61	1.62	5.17	4.02	1.31	T	T	17.19
1946	1.05	0.33	0.66	0.55	0.82	2.37	0.12	3.96	3.25	5.73	0.78	1.18	20.80
1947	0.32	0.07	0.77	2.07	4.59	3.19	1.54	0.39	0.24	0.12	0.92	1.26	15.48
1948	0.63	1.83	0.72	0.73	2.82	4.92	1.52	5.16	1.27	2.58	2.11	0.09	24.32
1949	2.04	0.59	0.57	1.99	0.43	2.82	3.90	2.78	1.69	1.03	0.01	0.30	23.15
1950	T	0.20	T	0.64	1.83	3.25	7.32	4.54	5.02	T	0.03	0.35	23.18
1951	0.38	1.17	0.55	0.43	9.81	4.34	2.01	1.52	2.01	2.37	0.25	0.45	25.29
1952	0.53	0.24	0.56	2.44	2.05	1.75	1.33	0.88	0.00	1.44	0.50	1.21	12.15
1953	0.64	0.53	0.38	0.62	0.70	0.01	1.81	2.00	0.26	4.56	0.56	0.98	13.05
1954	0.25	0.09	0.17	2.31	4.44	1.95	0.55	2.91	0.30	0.73	T	0.19	13.89
1955	0.53	0.06	0.33	0.38	2.70	1.49	3.35	1.49	3.13	0.13	0.02	0.10	13.71
1956	0.09	1.10	0.03	0.23	1.99	2.03	2.82	0.79	0.48	0.38	T	T	9.94
1957	0.33	1.11	2.82	2.69	4.36	0.53	0.13	4.85	0.88	2.57	0.94	0.63	21.74
1958	1.05	0.58	2.36	4.74	2.45	4.22	6.16	2.08	1.60	0.15	0.60	0.30	23.29
1959	0.16	0.06	0.26	1.18	4.82	2.19	2.85	2.24	2.29	2.10	0.14	4.52	22.81
1960	1.30	0.95	1.66	1.66	0.82	9.85	7.59	3.15	4.22	4.82	T	0.65	36.67
1961	0.12	0.27	2.55	0.24	3.40	3.42	4.10	3.14	1.87	0.91	2.26	0.16	22.44
1962	0.47	0.39	0.02	1.48	1.76	10.16	7.51	3.29	2.66	0.85	0.53	0.64	29.76
1963	0.06	0.67	0.28	0.47	3.66	3.60	2.04	3.93	0.43	1.54	0.33	0.29	17.30
1964	T	1.37	0.03	T	1.69	1.90	0.94	5.69	3.95	0.08	1.53	0.79	17.97
1965	0.59	0.47	0.72	0.23	1.88	10.73	1.54	1.71	0.79	1.02	0.07	0.38	20.09
1966	0.43	0.69	0.01	0.87	0.19	4.62	1.37	3.77	2.40	0.29	0.08	0.19	14.91
1967	T	0.15	0.22	1.93	1.40	2.59	3.70	1.81	2.47	1.61	0.28	0.51	16.85
1968	2.33	0.73	0.45	0.93	2.84	1.68	2.96	3.35	0.62	0.90	0.92	0.26	17.97
1969	0.02	0.30	1.15	0.30	2.93	4.09	2.55	4.31	2.77	2.56	0.34	0.03	22.55
1970	0.02	0.02	2.10	1.33	0.23	1.54	1.39	1.27	0.34	1.06	0.26	T	9.56
1971	0.10	1.65	0.10	0.77	0.91	4.17	1.75	3.33	4.70	2.59	2.08	0.69	23.06
RECORD MEAN	0.54	0.70	0.82	1.44	2.90	3.06	2.69	2.98	2.16	1.66	0.86	0.73	20.54

TOTAL SNOWFALL

Season	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Total
1932-33	0.0	0.0	0.0	T	T	10.9	0.0	2.8	T	0.1	0.0	0.0	13.8
1933-34	0.0	0.0	0.0	0.0	T	T	0.0	0.8	0.1	21.5	0.0	0.0	22.4
1934-35	0.0	0.0	0.0	0.0	0.9	3.0	T	1.2	4.9	0.0	2.2	0.0	12.2
1935-36	0.0	0.0	0.0	T	T	T	10.3	2.5	0.0	T	0.0	0.0	12.8
1936-37	0.0	0.0	0.0	2.3	0.0	0.5	3.1	1.1	4.2	1.1	0.0	0.0	12.3
1937-38	0.0	0.0	0.0	0.0	1.1	7.3	0.7	15.7	0.1	5.1	0.0	0.0	25.0
1938-39	0.0	0.0	0.0	0.0	T	1.0	6.9	2.4	1.2	3.3	0.0	0.0	14.8
1939-40	0.0	0.0	0.0	0.0	0.0	10.4	4.3	6.8	0.2	6.9	0.0	0.0	28.6
#1940-41	0.0	0.0	0.0	0.0	T	0.8	0.9	4.2	4.5	0.0	0.0	0.0	12.4
1941-42	0.0	0.0	0.0	0.7	3.1	1.8	4.0	2.5	7.5	T	0.0	0.0	19.6
1942-43	0.0	0.0	0.0	0.0	0.0	6.0	1.2	0.0	0.2	0.0	0.0	0.0	7.4
1943-44	0.0	0.0	0.0	0.0	2.0	8.5	6.1	1.3	T	0.0	0.0	0.0	17.9
1944-45	0.0	0.0	0.0	0.0	1.0	2.4	3.1	1.3	0.5	1.7	0.0	0.0	10.0
1945-46	0.0	0.0	T	T	0.0	T	6.9	0.8	T	0.0	0.0	0.0	7.7
1946-47	0.0	0.0	0.0	0.0	1.5	0.9	4.7	1.0	5.4	6.4	0.0	0.0	19.9
1947-48	0.0	0.0	0.0	0.0	T	4.1	7.3	8.6	4.1	0.0	0.0	0.0	24.1
1948-49	0.0	0.0	0.0	0.0	0.7	0.2	8.6	0.3	T	2.4	0.0	0.0	12.2
1949-50	0.0	0.0	0.0	T	0.0	0.1	T	T	T	T	0.0	0.0	0.1
1950-51	0.0	0.0	0.0	0.0	T	0.9	4.3	1.3	0.3	T	0.0	0.0	6.4
1951-52	0.0	0.0	0.0	0.0	0.9	4.5	4.0	0.4	0.2	T	0.0	0.0	10.0
1952-53	0.0	0.0	0.0	0.0	13.6	4.7	6.4	1.2	T	0.0	T	0.0	25.9
1953-54	0.0	0.0	0.0	0.0	0.0	1.5	3.1	0.2	1.5	0.0	0.0	0.0	6.3
1954-55	0.0	0.0	0.0	0.0	0.0	1.6	0.2	0.2	0.1	0.2	0.0	0.0	2.3
1955-56	0.0	0.0	0.0	0.0	0.2	1.8	0.7	14.7	0.3	T	0.0	0.0	17.7
1956-57	0.0	0.0	0.0	0.0	T	T	1.6	1.6	11.1	T	0.0	0.0	14.3
1957-58	0.0	0.0	0.0	T	2.9	0.0	5.2	5.2	8.6	T	0.0	0.0	21.9
1958-59	0.0	0.0	0.0	0.0	2.1	2.7	1.7	0.9	1.4	T	0.0	0.0	8.8
1959-60	0.0	0.0	0.0	0.0	0.9	T	12.9	5.9	0.5	0.0	0.0	0.0	20.2
1960-61	0.0	0.0	0.0	0.0	T	3.6	1.8	3.1	14.7	0.3	0.0	0.0	23.5
1961-62	0.0	0.0	0.0	0.0	4.9	0.5	2.3	0.1	T	0.0	0.0	0.0	7.8
1962-63	0.0	0.0	0.0	0.0	7.6	0.8	0.5	4.8	T	0.0	0.0	0.0	13.7
1963-64	0.0	0.0	0.0	0.0	0.0	3.6	T	17.3	T	T	0.0	0.0	20.9
1964-65	0.0	0.0	0.0	0.0	T	0.9	5.6	3.8	2.3	0.0	0.0	0.0	12.2
1965-66	0.0	0.0	0.0	0.0	0.0	1.4	7.2	0.4	0.1	0.0	0.0	0.0	9.1
1966-67	0.0	0.0	0.0	T	T	1.8	T	1.1	0.4	0.0	0.0	0.0	3.3
1967-68	0.0	0.0	0.0	T	2.1	6.1	0.6	8.0	2.9	0.0	0.0	0.0	19.7
1968-69	0.0	0.0	0.0	0.0	0.3	1.8	0.2	2.9	10.3	0.0	0.0	0.0	15.5
1969-70	0.0	0.0	0.0	0.0	T	7.1	0.1	T	14.1	1.8	0.0	0.0	23.1
1970-71	0.0	0.0	0.0	3.9	2.6	T	0.8	17.3	1.0	T	0.0	0.0	25.6
1971-72	0.0	0.0	0.0	0.0	T	7.9							

Record mean values above (not adjusted for instrument location changes listed in the Station Location table) are means for the period beginning in 1892.

# Indicates a break in the data sequence during the year, or season, due to a station move or relocation of instruments. See Station Location table. Data are from City Office locations through March 1941.

STATION LOCATION

AMARILLO, TEXAS

Location	Occupied from	Occupied to	Airline distance and direction from previous location	Latitude North	Longitude West	Elevation above Sea level: Ground at temperature site	Elevation above Ground: Wind instruments	Extreme thermometers	Psychrometer	Telepsychrometer	Tipping bucket rain gage	Weighing rain gage	8" rain gage	Hygrothermometer	Elevation above Sea level: Pyranometer	Remarks
CITY																
SW corner Polk and Fifth Streets	1/01/92	5/01/02		35° 13'	101° 50'	3657										Station established.
SW corner Polk and Fifth Streets	5/01/02	6/01/03	80 feet S	35° 13'	101° 50'	3657										Temporary quarters preparatory to moving into permanent ones.
SE corner Taylor and Seventh Streets	6/01/03	4/01/41	1100 ft. SE	35° 13'	101° 50'	3657	49	10	10		3		3			Tipping bucket record begun 11/16/02. WBO-WBAS consolidation 4/1/41.
AIRPORT																
Administration Building English Field Airport	6/12/31	11/29/37		35° 14'	101° 42'	3589	52	37	37				4			Bureau of Air Commerce to 4/9/32, Weather Bureau to 7/11/35, and CAA thereafter. Destroyed by fire 11/29/37. CAA observations at City Office site following fire to 12/15/37.
CAA Airway Building English Field Airport	12/15/37	3/22/41	400 feet SW	35° 14'	101° 42'	3590	17	4	4				4			CAA to 5/1/40 then Weather Bureau.
Administration Building Amarillo Air Terminal (Name changed from English Field Airport 1/1/50.)	3/22/41	Present	500 feet E	35° 14'	101° 42'	a3604	b23	5 f17	c5 f17	d5	4	4	4	e5		Weather Bureau operation. Thermometers, rain gages and wind equipment moved 525 feet SW without change in elevations 4/21/55. a - 3590 feet to 2/1/61. b - 33 feet to 5/3/61. c - Used to 4/21/55. d - Used 4/21/55 to 2/1/61. e - Installed 1-1/4 miles SW of thermometer site and commissioned 2/1/61. f - Standby equipment installed 4/1/63.

Requests for additional information should be directed to the National Weather Service Office for which this summary was issued.

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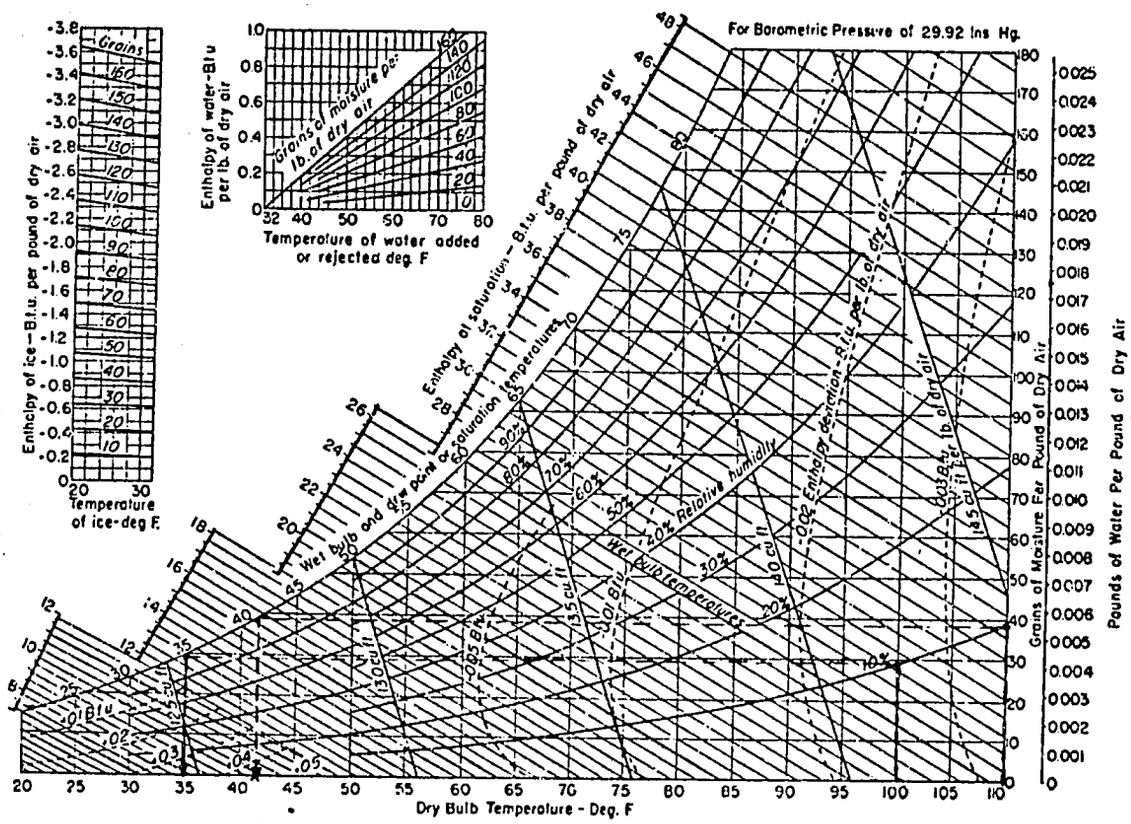
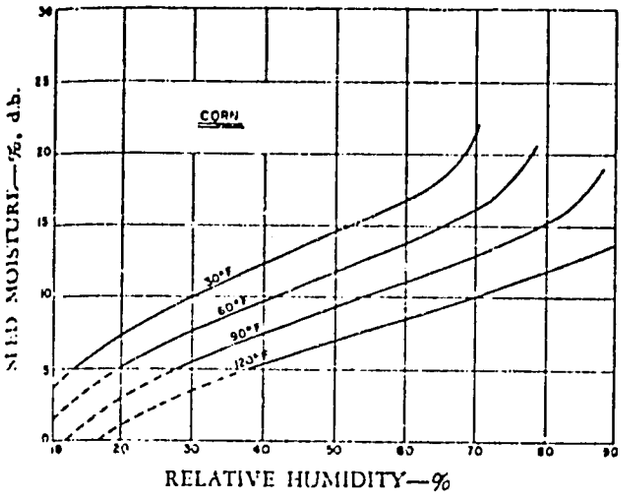
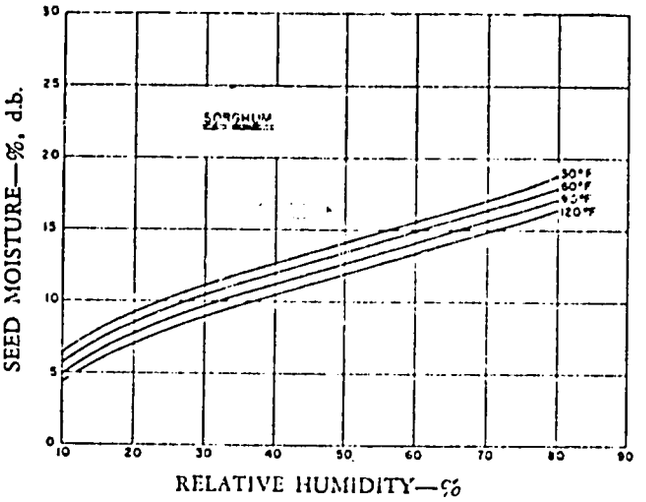
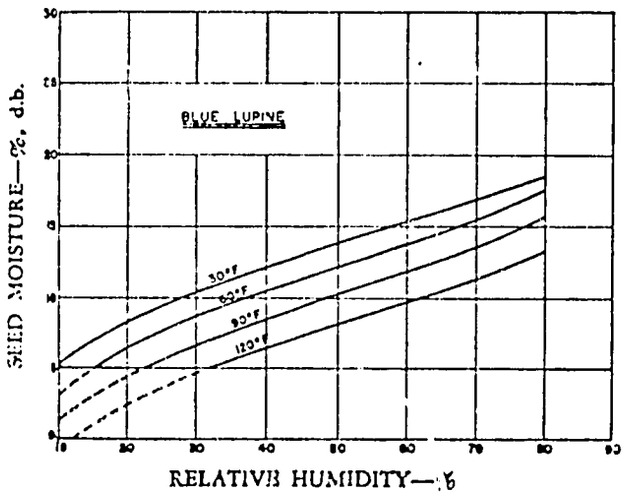
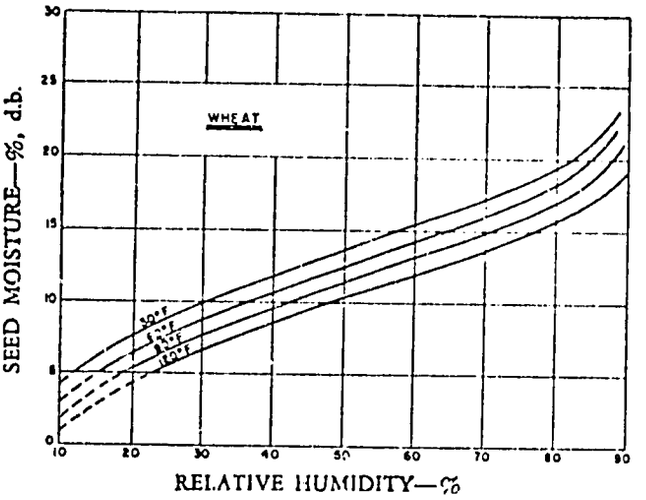


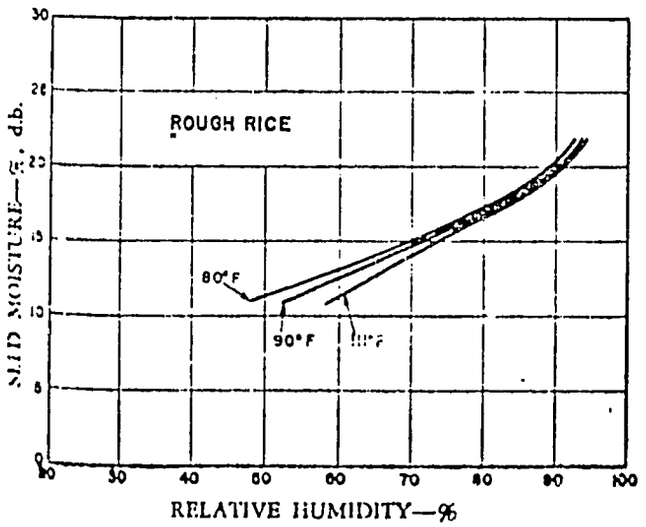
Psychrometric chart—medium temperatures. Barometric pressure, 29.92 in. of Hg.











Source, rough rice only. Hogan, J. T. and Karon, M. L., Hygroscopic Equilibrium of Rough Rice at Elevated Temperatures. Agr. and Food Chemistry, Vol. 3: No. 10, 1955, 855-860.

BIBLIOGRAPHIC DATA SHEET	1. Report No. AFR-631.23-C559	2.	3. Recipient's Accession No. PB-214 708
4. Title and Subtitle "Tour of Some U. S. Grain Storage Facilities for Entente Fund Officials"			5. Report Date May 1972 6.
7. Author(s) Do Sup Chung			8. Performing Organization Rept. No.
9. Performing Organization Name and Address Food and Feed Grain Institution Kansas State University ~~Manhattan, Kansas~~			10. Project/Task/Work Unit No. Proj. 931-11-150-786 11. Contract/Grant No. AID-csd-1588
12. Sponsoring Organization Name and Address Department of State Agency for International Development Washington, D.C. 20523			13. Type of Report & Period Covered 5/11 - 16/72 Trip report 14.

15. Supplementary Notes

16. Abstracts A four day tour of grain storage facilities for Entente Fund officials was conducted by Kansas State University. Fundamental principles concerning condensation and problems related to condensation in metal storage buildings were discussed. The following aspects were considered to be important in reducing the possibility of condensation in metal storage facilities for bagged grains: (1) adequate ventilation (2) white paint used to paint the exterior, (3) do not stack grain bags against the walls, and (4) cover the grain pile with a plastic sheet, or put insulation on the roof inside of the storage building, thus creating at least a twenty-degree F. temperature differential between the interior and exterior air. Metal and other types of facilities were visited in areas in western Kansas and Texas where comparable climatic conditions exist. The facilities visited were all the DeKalb Seed Company, and the locations were as follows: Holstead, Kansas, Ulysses, Kansas, and Dumas, Texas. Local climatological data summaries were supplied for the tour.

17. Key Words and Document Analysis. 17a. Descriptors

17b. Identifiers/Open-Ended Terms

(*Grain, Storage), *Silos

17c. COSATI Field/Group 6, 31

18. Availability Statement 1	19. Security Class (This Report) UNCLASSIFIED	21. No. of Pages 27
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