

ROUTING SLIP

DIVISION OF WILDLIFE REFUGES

DATE: Jan. 2 1946

MR. SALYER

SECTION OF HABITAT IMPROVEMENT:

MR. ELMER

Mr. Griffith

Dr. Bourn

Miss Cook

SECTION OF OPERATIONS:

SECTION OF LAND MANAGEMENT:

Mr. Regan

Mr. Krummes

Mr. DuPont

Miss Baum

SECTION OF STRUCTURES:

STENOGRAPHERS:

Mr. Taylor

REMARKS:

Lake Mason, Hailstone, Halfbreed, Lamesteer Basement Areas,

Narrative Reports May thru August

1945

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Weather Data

N R Form 1

N R Form 2



I. General

A Weather Conditions.

Cooler and drier than last year except in Wheat Basin (Hailstone and Halfbreed) where small summer storms kept the precipitation up. Considerably more wind than last year. Bad hailstorm on Lamesteer about July 1st. Weather reports attached.

B Water Conditions.

July 12	Hailstone	spill minus 28"
	Halfbreed	spill minus 7"
July 11	Lake Mason	spill minus 24"
	Miller Lake	spill minus 30"
July 14	Lamesteer	at spill

Runnoff was light on all areas except Lamesteer where Hailstorm kept lake spilling.

C Fires None.

II. Wildlife

A Migratory Birds

Waterfowl nesting in general on the areas this year was low.

Hailstone and Halfbreed were both below expectations. No large broods were observed.

Water birds and shore birds on these areas were few and far between.

Lake Mason waterfowl population was good but broods were scarce.

Gulls, both California and Franklins were common on the area. Also pelicans.

Several colonies of ^{Lake Mason} Bared Grebes, the first mass nesting to occur on this area made up a total of about 1500 nests on floating mats of sago and millfoil. These were around the north west edge of the lake and usually in about 20" of water.

A few shore birds (see N R 1) used the area.

Waterfowl production on Miller lake appears to be increasing with aquatic growth. Besides a small waterfowl production a colony of common terns nested on the island.

Lamesteer on June 20th had 8 broods of birds on it and because of the hailstorm had only 1 week old brood on July 14.

2. Food and Cover

Aquatic vegetation furnished adequate food for waterfowl population on all areas except Lamesteer where it is scarce. Hailstone, Halfbreed, Lake Mason and Miller Lake produces an immense amount of aquatic vegetation. Sago pondweed predominates in these areas. Lamesteer this year had a good start of this plant and unless something happens will be producing large quantities of sago within two years.

3. Disease

None on any area.

B Upland Game Birds

None were observed on any area thru this period.

C Big Game Animals

On July 11 fifteen adult and seven juvenile antelope were observed near the Miller Lake unit of Lake Mason Refuge. All were in good condition and grazing on butulua gracillis which was abundant.

D Fur Animals

Muskrats

Four muskrat runs were observed around the shore of Lake Mason on 7-11-45. One observed. Population estimated at fifty.

On June 20 six muskrats were observed on Lamesteer. Population estimated at fifty.

No fur bearers or signs other than above observed on any other area.

Local contacts indicated a population of nine coyotes on and in the vicinity of Lake Mason. None observed. Local sheepmen control population.

E Predaceous Birds

None observed nor were there any signs of any on any area.

F Fish

Seine tests for identification of all species in all water areas planned for this period could not be made. Will make these next summer. As far as is known there was no fishing done on any easment thru this period.

III. Refuge Maintenance

B Plantings

1. Aquatic and marsh plants

On July 13 five sacks of sago pondweed were collected from Miller Lake where a large area of shallow water bears a heavy stand.

These were planted in Lamesteer Lake on July 14.

C Collections

As listed immediately above.

Repairs

The only repairs needed on any unit were to the Halfbreed crest wall.

This consisted in chipping or breaking all sluffing concrete possible by hand, off the wall, preparation of forms and pouring in new concrete. Sulphate resistant cement was used.

Mr. DuBeau did this work with one part time laborer while I was detailed to Medicine Lake. Approximate costs, man hours etc., follows.

Sand and gravel	\$4.50	
Cement	7.00	
Mixer rental	5.00	
Nails, wire, etc.	3.00	
Fort Peck salvage lumber	3.00	
Total material		\$22.50
Labor hired 22½ hours		13.63
Truck mileage		60.00
Per diem		52.08
Total job cost	\$148.21	
Total paid man hours		
Hired laborer	22.5	
DuBeau	104	
Total official hrs.	126.5	

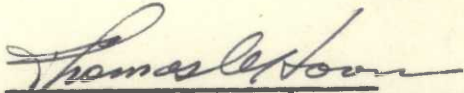
Unpaid overtime by DuBeau

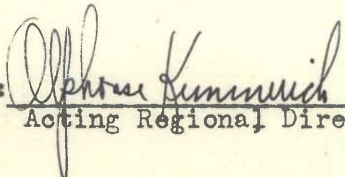
22

Total hours used

148.5

Submitted 12-7-45


Thomas C. Horn, Refuge Manager

Approved: 
Acting Regional Director

Refuge Fort Peak Enclosures Months of May to August, 1945

1612

(1) Species Common Name	(2) First Observed		(3) Became Common	(4) Peak Concentration		(5) Last Observed		(6) Young Produced			(7) Total
	Number	Date	Date	Number	Date	Number	Date	No. Broods Obsvd.	Avg. Size	Esti- mated Total	Number Using Refuge
Hallstone								5	6	90	240
Mallard								2	5	30	110
Gadwall										20	60
Baldpate								4	6	72	152
B W Teal								5	7	105	205
Shoveler								1	7	21	121
Pintail											10
Blue Heron											30
Coat											
Halfbreed											
Mallard								4	5	60	160
Gadwall								1	7	21	96
B W Teal								5	6	90	170
Shoveler								2	9	54	114
Pintail								2	6	36	116
Blue heron											7

REMARKS: (Pertinent information not specifically requested)

Good nesting cover has developed along the south west side of Halfbreed.

Only small spots of nesting cover on Hallstone.

INSTRUCTIONS

Form NR-1 - MIGRATORY BIRDS (Include species in families Gaviidae through Strigidae; also doves and woodcocks)*

In case a resident form occurs, such as mottled duck on the Gulf Coast, use only the columns that apply.

- | | |
|-------------------------|---|
| (1) SPECIES: | Use correct common names as found in the A.O.U. Check List, 1931 Edition, and list in A.O.U. order. General terms are to be avoided, such as "scaup", "teal", etc.; use "green-winged teal" or "lesser scaup". |
| (2) FIRST OBSERVED: | The first refuge record for the species during spring migration, fall migration, wintering, or summering, and the number observed. In the case of resident species this column may be disregarded. |
| (3) BECAME COMMON: | The date the species became common on the refuge. |
| (4) PEAK CONCENTRATION: | The greatest number of the species present on any one date or limited interval of time. |
| (5) LAST OBSERVED: | The last refuge record for the species during the spring or fall migration, wintering, or summering, and the numbers observed exclusive of obvious cripples or non-migrants. |
| (6) YOUNG PRODUCED: | Estimated number of young produced based upon observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact are to be omitted. |
| (7) TOTAL: | Estimated total number of the species using the refuge during the period. This figure may or may not be more than that used for peak concentrations, depending upon the manner in which birds come through; i.e., in waves or all at once. On refuges representing the terminus of the flight lane, the figures would probably be the same in many cases. |

* Only columns applicable to the period covered should be used.

Refuge Fort Peck BasementsMonths of May to August, 1945

1612

(1) Species Common Name	(2) First Observed		(3) Became Common	(4) Peak Concentration		(5) Last Observed		(6) Young Produced			(7) Total
	Number	Date	Date	Number	Date	Number	Date	No. Broods Obsvd.	Avg. Size	Esti- mated Total	Number Using Refuge
Lake Mason											
Bared Grebe								1500 nests		2500	3500
California gull											1000
Ringbill gull											300
Franklin's gull											55
White pelicans											6750
Mallard								20	8	560	3200
Baldpate											3440
Blue W Teal								10	8	240	1600
Shoveler										100	1900
Pintails								20	5	300	250
Bufflehead											25
Blue heron											40
Wilson's phalarope											10
Avocet											4
Least sandpiper											10
Marbled godwit											40
Willet											2
Long bill curlew											200
Kildeer											

REMARKS: (Pertinent information not specifically requested)

Many water puppies in lake.

INSTRUCTIONS

Form NR-1 - MIGRATORY BIRDS (Include species in families Gaviidae through Strigidae; also doves and woodcocks)*

In case a resident form occurs, such as mottled duck on the Gulf Coast, use only the columns that apply.

- (1) SPECIES: Use correct common names as found in the A.O.U. Check List, 1931 Edition, and list in A.O.U. order. General terms are to be avoided, such as "scaup", "teal", etc.; use "green-winged teal" or "lesser scaup".
- (2) FIRST OBSERVED: The first refuge record for the species during spring migration, fall migration, wintering, or summering, and the number observed. In the case of resident species this column may be disregarded.
- (3) BECAME COMMON: The date the species became common on the refuge.
- (4) PEAK CONCENTRATION: The greatest number of the species present on any one date or limited interval of time.
- (5) LAST OBSERVED: The last refuge record for the species during the spring or fall migration, wintering, or summering, and the numbers observed exclusive of obvious cripples or non-migrants.
- (6) YOUNG PRODUCED: Estimated number of young produced based upon observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact are to be omitted.
- (7) TOTAL: Estimated total number of the species using the refuge during the period. This figure may or may not be more than that used for peak concentrations, depending upon the manner in which birds come through; i.e., in waves or all at once. On refuges representing the terminus of the flight lane, the figures would probably be the same in many cases.

* Only columns applicable to the period covered should be used.

Refuge Fort Peck Easement Months of May to August, 1945

1612

(1) Species	(2) First Observed		(3) Became Common	(4) Peak Concentration		(5) Last Observed		(6) Young Produced			(7) Total
	Number	Date	Date	Number	Date	Number	Date	No. Broods Obsvd.	Avg. Size	Esti- mated Total	Number Using Refuge
Lake Mason - Miller Lake											
Harlequin Grebe										20	8
Common tern										24	5
Mallard								1	12	12	124
Gadwall								1	6	12	18
Baldpate											100
B W Teal								2	9	18	43
Pintail								1	14	28	53
Blue heron											2
Killdeer											20
Lamesteer											
Mallard								2	5	Killed	10
Pintail								6	6	Killed	15
B W Teal								1	5	8	10

REMARKS: (Pertinent information not specifically requested)

Miller Lake has an excellent stand of sage - Hardstem up to 10' high spreading rapidly. ^{before}
 A hailstorm on Lamesteer about July 1st killed all broods on the lake, that had hatched ~~after~~ the hailstorm
~~evidently~~. This brood and several dead ducklings were observed on July 14.

INSTRUCTIONS

Form NR-1 - MIGRATORY BIRDS (Include species in families Gaviidae through Strigidae; also doves and woodcocks)*

In case a resident form occurs, such as mottled duck on the Gulf Coast, use only the columns that apply.

- | | |
|-------------------------|---|
| (1) SPECIES: | Use correct common names as found in the A.O.U. Check List, 1931 Edition, and list in A.O.U. order. General terms are to be avoided, such as "scaup", "teal", etc.; use "green-winged teal" or "lesser scaup". |
| (2) FIRST OBSERVED: | The first refuge record for the species during spring migration, fall migration, wintering, or summering, and the number observed. In the case of resident species this column may be disregarded. |
| (3) BECAME COMMON: | The date the species became common on the refuge. |
| (4) PEAK CONCENTRATION: | The greatest number of the species present on any one date or limited interval of time. |
| (5) LAST OBSERVED: | The last refuge record for the species during the spring or fall migration, wintering, or summering, and the numbers observed exclusive of obvious cripples or non-migrants. |
| (6) YOUNG PRODUCED: | Estimated number of young produced based upon observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact are to be omitted. |
| (7) TOTAL: | Estimated total number of the species using the refuge during the period. This figure may or may not be more than that used for peak concentrations, depending upon the manner in which birds come through; i.e., in waves or all at once. On refuges representing the terminus of the flight lane, the figures would probably be the same in many cases. |

* Only columns applicable to the period covered should be used.

Refuge Fort Peck ReservoirsMonths of Mayto August, 194 8

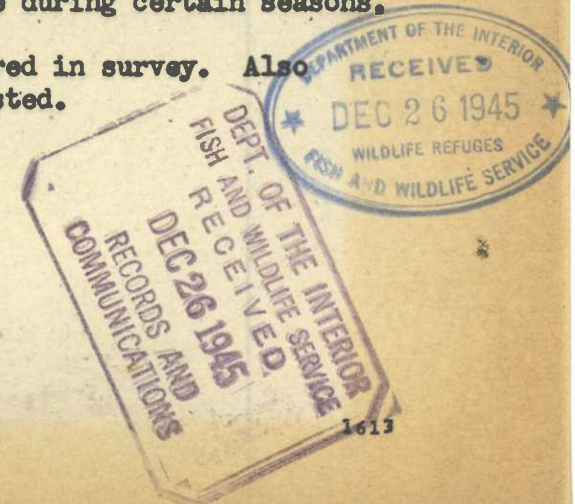
(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres per Bird	Number broods obs'd.	Estimated Total	Percentage	Hunting	For Re- stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Upland Birds	All easement areas were reasonably well covered and no upland birds were observed thru this period.									

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS.*

- (1) SPECIES: Use correct common name.
- (2) DENSITY: Applies particularly to those species considered in removal programs (public hunts, etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.
- (3) YOUNG PRODUCED: Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.
- (4) SEX RATIO: This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.
- (5) REMOVALS: Indicate total number in each category removed during the report period.
- (6) TOTAL: Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.
- (7) REMARKS: Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

* Only columns applicable to the period covered should be used.



WEATHER BUREAU

MONTHLY METEOROLOGICAL SUMMARY

STATION Billings, Montana (Municipal Airport)MONTH April, 1945

DATE	TEMPERATURE ° F					PRECIPITATION				WIND		WEATHER	
	MAXIMUM	MINIMUM	MEAN	DEPARTURE FROM NORMAL	DEGREE DAYS BASE 65°	TOTAL (INCHES)	# SNOWFALL (INCHES) P. M. TO P. M. (UNMELTED)	DEPTH OF SNOW ON THE GROUND P. M. *	PREVAILING DIRECTION	HIGHEST VELOCITY	DIRECTION	PERCENT OF POSSIBLE SUNSHINE	COVERAGE CLOUDINESS SCALE 0 TO 10
1..	29	19	24	-16	41	0.13	1.9	1.9	NE	35	NE	0	10
2..	27	15	21	-20	44	T	T	1.2	SW	10	SW	72	7
3..	35	9	22	-19	43	0	0	T	SW	15	SW	100	2
4..	46	23	34	- 8	31	T	T	T	SW	26	NW	78	6
5..	55	36	46	+ 4	19	T	0	0	SW	26	SW	54	9
6..	53	34	44	+ 2	21	T	0	0	SW-NW	23	NW	67	8
7..	62	34	48	+ 5	17	T	0	0	SW	17	NE	58	9+
8..	63	30	46	+ 3	19	0.03	T	0	SW	34	NW	74	9+
9..	42	30	36	- 8	29	0.10	2.0	0	S	13	N	38	10
10..	41	28	34	-10	31	T	T	0	N	17	N	21	10
11..	47	26	36	- 8	29	T	T	0	SW	25	NW	63	7
12..	47	27	37	- 8	28	0	0	0	NE	26	NE	68	9
13..	42	30	36	- 9	29	T	T	0	N-NE	14	NE	32	10
14..	48	22	35	-11	30	0	0	0	SW	29	SW	97	2
15..	44	32	38	- 8	27	0.01	T	0	SW	24	N	0	10
16..	43	30	36	-10	29	0.02	T	0	N	25	N	54	10
17..	37	25	31	-16	34	0.02	T	0	SW	20	N	21	10
18..	54	20	40	- 7	25	0	0	0	SW	24	SW	61	9+
19..	65	42	54	+ 7	11	0	0	0	SW	26	W	75	9
20..	71	50	60	+12	5	T	0	0	SE	31	NW	81	9
21..	74	45	60	+12	5	0.23	0	0	SW	34	NW	55	9
22..	53	37	45	- 3	20	0.02	0	0	NW	29	NW	53	8
23..	53	35	44	- 5	21	0.04	0	0	SW	17	SW	43	8
24..	52	34	43	- 6	22	0.04	0	0	NW	34	NW	71	8
25..	52	32	42	- 7	23	T	0	0	NW	24	NW	77	6
26..	60	30	45	- 5	20	0	0	0	SW	11	SW	70	4
27..	65	41	53	+ 3	12	0	0	0	SW	25	NW	82	7
28..	55	35	45	- 6	20	T	0	0	NE	24	NW	76	8
29..	60	31	46	- 5	19	0	0	0	N	10	SE	96	9
30..	68	40	54	+ 3	11	T	0	0	SW	29	NW	79	9
31..													
MEAN	51.4	30.7	41.0		715	0.64	3.9	-	SW	35	NE	61	8.0
Normal			46.0								April-1		

105 TH MERIDIAN TIME. T INDICATES A TRACE OF PRECIPITATION *TOTAL PRECIPITATION b. for 5-minute period

°SUNRISE TO SUNSET: 0 TO 3, CLEAR; 4 TO 7, PARTLY CLOUDY; 8 TO 10, CLOUDY.

* 5:30 p.m.

Midnight to Midnight

SUMMARY

BAROMETRIC PRESSURE (SEA LEVEL)

Monthly mean 29.98
Highest 30.50, date 13th
Lowest 29.37, date 8th

TEMPERATURE

Highest 74, date 21st
Lowest 9, date 3d
Extremes this month since 1935: highest 92, on 29th,
in 1939: lowest -5, on 2d, in 1936
Average daily departure -5.0
Average daily departure since January 1, +1.6

PRECIPITATION

Greatest amount in 24 hours 0.23, date 21st
Departure from normal this month -
Accumulated departure since -
Snowfall, greatest 24-hour amount 2.0", date 8th-9th

WIND

Prevailing direction SW, average hourly velocity 11.4
Highest wind velocity this month since 1939
45 miles from NW, on 15, in 1939

WEATHER

Number of days clear 2, partly cloudy 6, cloudy 22,
with measurable precipitation (0.01 inch, or more) 10

MISCELLANEOUS PHENOMENA—DATES OF

Hail 22
Fog, light 9, 11, 12, 15, 16, 26
Fog, heavy 9, 11, 12, 26
Frost, light -, heavy -, killing† -
Sleet -
Thunderstorms 21

Duststorms -
†Frosts not recorded in autumn after first "killing", except in Florida and along immediate coast of the Gulf of Mexico.

MEAN TEMPERATURE AND TOTAL PRECIPITATION THIS MONTH IN—

1875	87		99	47	T	11	43	0.97	23	44	1.13	35	42	0.97	
1876	88		00	48	-	12	46	1.92	24	45	0.59	36	45	0.78	
1877	89		01	47	-	13	48	0.22	25	49	1.58	37	47	0.72	
1878	90		02	42	-	14	46	1.18	26	47	0.42	38	48	0.50	
1879	91		03	42	-	15	54	0.31	27	43	2.10	39	48	0.83	
1880	92		04	-	-	16	46	1.27	28	44	0.48	40	42	3.16	
1881	93	41	1.48	05	51	1.42	17	42	1.99	29	44	0.50	41	45	2.00
1882	94	53	1.90	06	52	2.96	18	43	1.58	30	53	0.87	42	49	1.28
1883	95	59	2.10	07	45	1.21	19	49	0.17	31	46	0.98	43	52	0.49
1884	96	48	0.63	08	52	1.17	20	38	1.40	32	46	2.24	44	49	0.10
1885	97	-	-	09	41	0.93	21	46	0.83	33	46	0.84	45	41	0.64
1886	98	50	0.02	10	54	1.48	22	45	2.91	34	52	0.41	46		

Data prior to 1935 from records taken in the City of Billings. L. T. Pierce,

Subsequent data from records at Airport.

Meteorologist Weather Bureau.

66.1

UNITED STATES DEPARTMENT OF COMMERCE
WEATHER BUREAU

STATION Billings, Montana DATE April, 1945 WB Form 1030
(Municipal Airport)

Psychrometric Data

Date	11:30 p.m. #				5:30 a.m.				11:30 a.m.				5:30 p.m.			
	Dry	Wet	Dew Pt.	Rel Hum	Dry	Wet	Dew Pt.	Rel Hum	Dry	Wet	Dew Pt.	Rel Hum	Dry	Wet	Dew Pt.	Rel Hum
1	29.1	27.3	25	82	27.7	27.7	28	100	25.6	24.7	23	90	23.9	21.9	18	75
2	19.6	18.9	17	89	19.8	18.5	16	83	20.8	17.1	6	48	26.1	22.0	13	55
3	17.3	16.1	13	81	10.7	10.1	8	70	23.8	20.8	14	62	34.3	28.2	18	46
4	25.3	23.9	21	82	25.0	24.5	24	94	38.5	32.0	23	51	42.3	34.0	22	42
5	36.2	30.9	23	56	37.3	32.2	25	59	49.2	40.3	30	47	52.2	40.9	27	37
6	38.8	34.2	28	63	36.2	33.1	29	74	48.3	41.9	35	60	51.2	42.2	32	48
7	40.2	37.9	35	81	37.1	34.3	31	77	56.9	45.0	32	40	60.0	46.9	34	37
8	47.6	41.0	34	58	36.2	33.2	29	75	59.8	45.7	31	33	60.7	47.8	35	39
9	35.0	34.5	34	98	31.0	31.0	31	100	33.5	32.7	32	93	41.1	35.2	28	57
10	31.3	28.6	25	73	28.8	25.9	21	69	37.0	32.1	25	60	35.6	32.9	29	77
11	29.8	29.0	28	91	28.2	26.5	24	82	44.5	37.1	28	50	37.8	34.9	31	77
12	32.1	31.7	31	96	28.2	27.8	27	95	40.8	34.9	27	56	44.1	34.6	21	36
13	32.1	28.9	24	68	29.8	27.2	23	73	37.0	32.6	27	64	41.1	34.8	26	53
14	31.0	28.9	26	79	24.7	23.0	20	80	43.1	35.0	24	44	47.9	37.8	25	39
15	36.1	30.5	22	53	35.0	30.1	22	56	41.1	35.0	27	56	42.9	39.6	36	76
16	33.2	33.2	33	100	33.3	31.2	28	79	37.7	32.1	24	55	42.2	34.9	25	48
17	30.8	30.6	30	99	28.5	25.8	21	70	27.9	27.3	26	93	32.9	30.8	28	80
18	29.9	28.9	28	90	26.6	25.4	24	88	47.5	38.8	28	46	54.5	43.7	32	41
19	46.4	41.1	35	66	44.2	40.0	35	71	59.4	45.2	29	25	64.1	46.2	26	23
20	54.9	44.6	34	44	51.1	42.1	32	48	63.3	47.0	30	28	70.3	51.2	33	26
21	54.9	43.7	31	40	47.2	41.6	35	63	64.2	53.0	44	48	61.3	51.1	43	50
22	49.1	40.9	31	50	41.0	35.5	28	59	49.5	40.7	30	47	42.5	39.2	36	76
23	39.9	36.8	33	76	35.5	34.1	32	88	50.2	40.6	29	43	42.0	40.2	38	86
24	38.9	38.3	38	96	35.3	33.7	32	86	48.1	39.5	29	47	38.1	37.4	37	91
25	35.9	34.1	32	84	32.2	29.8	26	76	46.2	37.1	25	41	48.0	40.3	31	52
26	36.5	35.1	33	88	29.8	29.8	30	100	41.4	38.0	34	75	59.2	44.9	29	31
27	46.1	38.8	30	53	43.0	37.8	31	63	60.3	45.6	30	31	63.0	45.9	27	24
28	53.1	42.0	29	39	43.5	36.2	27	50	51.9	40.0	25	33	48.3	38.8	27	42
29	35.9	32.8	29	74	31.1	28.8	26	77	50.1	40.7	30	45	60.1	46.3	32	34
30	49.0	40.1	29	46	41.1	36.3	30	64	65.7	48.8	32	28	64.9	50.8	39	38
31																
Mean	37.2	33.4	29	73	33.3	30.4	26	76	45.4	37.4	28	51	47.8	39.2	29	51

Previous Day

FLYING WEATHER

Contact. 694.2 Hours
Instrument 25.8 "

MAXIMUM AMOUNTS OF PRECIPITATION BY PERIODS

Maximum Precipitation in 5 minutes .06, on the 21st
" 10 " .09, " " 21st
" 15 " .13, " " 21st
20 " .13, " " 21st
30 " .16, " " 21st
1 hour .17, " " 21st
2 hours .17, " " 21st

GROWING SEASON

(Based on observations from 1894 to 1944, inclusive)

Average date of latest killing frost in spring. . . . May 15
" " " first killing frost in autumn September 24
" length of growing season, days. 132



MONTHLY METEOROLOGICAL SUMMARY

STATION Billings, Montana (Municipal Airport)MONTH May, 1945

DATE	TEMPERATURE ° F					PRECIPITATION				WIND		WEATHER		
	MAXIMUM	MINIMUM	MEAN	DEPARTURE FROM NORMAL	DEGREE DAYS BASE 65°	TOTAL	(INCHES)	SNOWFALL (INCHES) P. M. TO P. M. (UNMELTED)	DEPTH OF SNOW ON THE GROUND P. M. *	PREVAILING DIRECTION	HIGHEST VELOCITY	DIRECTION	PERCENT OF POSSIBLE SUNSHINE	SAVERAGE CLOUDINESS SCALE 0 TO 10
1..	69	47	58	+ 6	7	0	0	0	0	NW	25	N	77	8
2..	62	38	50	- 2	15	0	0	0	0	NE	16	NE	92	3
3..	71	37	54	+ 2	11	0	0	0	0	N-SE	13	N	100	1
4..	84	42	63	+10	2	T	0	0	0	SW	34	NW	87	3
5..	73	51	62	+ 9	3	T	0	0	0	SW	20	N	89	7
6..	61	37	49	- 4	16	0	0	0	0	NE	35	NW	62	8
7..	47	36	42	-12	23	T	T	0	0	NE	24	NE	50	9
8..	58	30	44	-10	21	0	0	0	0	NE	29	NE	70	6
9..	53	30	42	-12	23	0	0	0	0	NE	24	NE	88	2
10..	66	37	52	- 2	13	T	0	0	0	SW	26	NW	56	9
11..	62	46	54	- 1	11	.01	0	0	0	NW	22	NW	58	8
12..	62	46	54	- 1	11	T	0	0	0	SW	20	W	61	9
13..	50	32	41	-14	24	.35	T	0	0	NE	24	NE	0	10
14..	40	30	35	-21	30	.02	T	0	0	NE	17	NE	0	10
15..	46	32	39	-17	26	T	0	0	0	NE	16	NE	1	10
16..	65	38	52	- 4	13	T	0	0	0	SE	17	SE	81	5
17..	64	49	56	0	9	.01	0	0	0	NW	26	NW	60	7
18..	63	44	54	- 3	11	T	0	0	0	N	20	NW	75	7
19..	47	40	44	-13	21	.89	0	0	0	N	23	NE	0	10
20..	50	40	45	-12	20	.10	0	0	0	NE	24	NE	30	10
21..	61	36	48	-10	17	0	0	0	0	SW	11	N	82	7
22..	63	40	52	- 6	13	T	0	0	0	SW	17	N	90	6
23..	72	43	58	0	7	.02	0	0	0	SW	24	NW	76	7
24..	72	45	58	0	7	.08	0	0	0	SW	25	NW	86	5
25..	71	45	58	- 1	7	T	0	0	0	NE	17	NE	92	6
26..	65	49	57	- 2	8	.22	0	0	0	NE	34	N	61	8
27..	59	46	52	- 7	13	T	0	0	0	N	22	N	47	9
28..	67	42	54	- 6	11	T	0	0	0	SW	29	N	97	4
29..	72	44	58	- 2	7	0	0	0	0	E	14	E	100	1
30..	79	48	64	+ 4	1	T	0	0	0	SW	24	NW	85	4
31..	65	52	58	- 2	7	.16	0	0	0	SW	26	NW	34	9
MEAN	62.5	41.0	51.9		408	.186	T	0	0	SW	35	NW	72	6.7
Normal			56.1											

105...TH MERIDIAN TIME. T INDICATES A TRACE OF PRECIPITATION *TOTAL MONTHLY b. for 5-minute period

cSUNRISE TO SUNSET: 0 TO 3, CLEAR; 4 TO 7, PARTLY CLOUDY; 8 TO 10, CLOUDY.

* 5:30 p.m.

Midnight to Midnight

SUMMARY

BAROMETRIC PRESSURE (SEA LEVEL)

Monthly mean...29.91

Highest...30.44, date...2d

Lowest...29.45, date...31st

TEMPERATURE

Highest...84, date...4th

Lowest...30, date...14th

Extremes this month since 1935...highest...96, on 14th

in 1936...lowest...26, on 12th, in 1943

Average daily departure...-4.3

Average daily departure since January 1...+0.7

PRECIPITATION

Greatest amount in 24 hours...0.98, date 19th - 20th

Departure from normal this month...

Accumulated departure since...

Snowfall greatest 24-hour amount...T, date 13th - 14th

WIND

Prevailing direction...SW

Highest wind velocity this month since 1939

45 miles from NW, on 15th, in 1939

WEATHER

Number of days clear...5, partly cloudy...12, cloudy...14

with measurable precipitation (0.01 inch, or more)...10

MISCELLANEOUS PHENOMENA—DATES OF

Hail...0

Fog, light...13, 14, 15, 19, 21

Fog, heavy...21

Frost, light...8, 9, 14, heavy...0, killing...0

Sleet...0

Thunderstorms...23, 24, 26, 30, 31

Duststorms...0

†Frosts not recorded in autumn after first "killing", except in Florida and along immediate coast of the Gulf of Mexico.

MEAN TEMPERATURE AND TOTAL PRECIPITATION THIS MONTH IN—

1875	87	99.54	3.50	11.54	3.24	23.56	2.94	35.52	2.78
1876	88	00.	—	12.54	2.58	24.53	2.05	36.65	1.07
1877	89	01.63	—	13.54	1.49	25.57	1.44	37.60	0.53
1878	90	02.60	—	14.55	1.96	26.58	1.64	38.54	4.09
1879	91	03.48	—	15.54	2.86	27.50	3.70	39.59	1.75
1880	92	04.	—	16.52	2.38	28.61	0.75	40.60	0.81
1881	93.49	05.53	3.86	17.51	4.01	29.53	1.25	41.59	2.00
1882	94.60	06.57	3.04	18.53	2.44	30.55	0.42	42.52	4.93
1883	95.58	07.52	4.63	19.58	1.22	31.56	0.67	43.51	1.24
1884	96.56	08.56	5.37	20.53	2.45	32.56	1.90	44.59	0.73
1885	97.62	09.50	1.64	21.55	3.30	33.55	2.63	45.52	1.86
1886	98.52	10.56	1.48	22.55	2.05	34.65	0.27	46.	

Data prior to 1935 from records taken in the City of Billings, L. T. Pierce,

subsequent data from records at Airport.

Meteorologist Weather Bureau.

UNITED STATES DEPARTMENT OF COMMERCE
WEATHER BUREAU

STATION Billings, Montana DATE May, 1945 WB Form 1030
(Municipal Airport)

Psychrometric Data

Date	11:30 p.m.				5:30 a.m.				11:30 a.m.				5:30 p.m.			
	Dry	Wet	Dew Pt.	Rel Hum	Dry	Wet	Dew Pt.	Rel Hum	Dry	Wet	Dew Pt.	Rel Hum	Dry	Wet	Dew Pt.	Rel Hum
1	53.8	44.2	34	47	48.1	42.0	35	61	61.5	48.0	35	37	67.5	49.5	32	26
2	48.8	40.8	32	51	38.9	32.8	24	55	54.0	41.8	27	34	60.3	46.8	33	36
3	47.0	38.1	27	44	37.3	31.9	24	56	57.9	45.0	31	36	69.9	50.2	31	23
4	54.1	43.7	32	43	44.9	38.8	31	59	69.1	52.8	39	33	80.9	58.8	43	27
5	64.9	52.9	44	46	50.9	48.8	47	88	63.0	53.8	47	57	71.9	56.9	47	41
6	60.8	52.1	45	57	47.2	41.1	34	61	45.2	38.2	30	54	46.9	37.2	24	39
7	39.8	33.4	24	52	36.2	32.9	29	72	43.8	34.3	20	36	45.0	35.6	22	38
8	37.5	32.0	24	55	31.9	26.2	15	46	46.8	36.7	23	37	58.1	45.1	31	35
9	39.5	30.5	15	33	31.0	27.8	23	68	42.8	37.7	32	64	52.8	45.2	38	57
10	42.8	39.0	35	74	38.6	35.8	32	78	53.7	48.8	45	73	65.0	55.5	49	56
11	57.1	47.3	38	49	46.3	39.8	32	58	58.9	47.3	36	42	60.0	50.0	42	51
12	47.9	47.0	46	90	46.2	44.8	44	90	58.2	50.6	45	61	61.5	52.8	46	58
13	51.5	50.3	50	93	43.8	42.9	42	94	44.9	44.9	45	100	36.0	36.0	36	100
14	31.8	31.8	32	100	31.0	30.8	31	98	35.1	33.2	31	84	38.5	36.2	33	82
15	34.5	34.0	33	96	32.3	32.0	32	98	40.3	38.9	37	89	44.5	41.8	39	82
16	42.4	41.2	40	91	38.8	38.2	38	96	57.1	48.7	41	56	63.3	52.2	44	48
17	57.4	50.2	44	62	52.5	48.4	45	76	60.9	51.9	45	56	61.8	50.8	42	48
18	50.0	48.8	48	93	45.1	43.8	43	91	59.6	52.3	47	62	60.5	50.4	42	51
19	48.3	45.5	43	81	45.0	44.5	44	96	43.9	43.9	44	100	43.2	43.0	43	98
20	41.4	41.4	41	100	40.6	40.6	41	100	47.0	43.3	40	75	48.3	45.0	42	79
21	40.8	40.2	40	95	36.4	36.4	36	100	56.0	48.8	43	61	60.2	50.8	43	53
22	48.8	45.3	42	78	41.5	40.5	40	92	57.2	49.3	43	59	61.8	53.9	48	60
23	52.1	48.0	45	76	44.4	43.4	42	93	61.8	54.1	49	63	70.5	58.3	51	50
24	53.5	51.2	50	87	45.3	45.0	45	97	67.5	55.0	46	46	62.9	55.9	51	66
25	51.1	47.8	45	80	46.9	44.8	43	87	64.9	56.1	50	46	71.1	58.2	50	47
26	59.2	53.8	50	72	50.0	47.9	46	86	62.2	55.9	52	69	54.9	52.1	50	85
27	49.1	49.1	49	100	50.0	49.5	49	96	48.5	45.0	42	78	57.8	49.6	43	58
28	46.7	44.9	43	89	43.0	42.6	42	97	62.0	54.5	49	63	61.1	52.7	46	58
29	53.4	48.8	45	73	45.5	44.2	43	91	66.9	59.0	54	64	71.4	60.0	53	53
30	59.5	54.0	50	72	50.1	49.5	49	95	72.6	61.8	56	56	75.3	61.0	53	45
31	61.2	52.8	47	58	53.2	51.6	50	90	58.1	55.6	54	86	62.8	52.4	44	51
Mean	49.2	44.5	40	72	43.0	40.6	38	83	56.2	48.0	41	61	59.5	49.8	42	55

#Previous Day

FLYING WEATHER

Contact. 694.0 Hours
Instrument 50.0 "

MAXIMUM AMOUNTS OF PRECIPITATION BY PERIODS

Maximum Precipitation in 5 minutes .04 on the 24th
10 " .06 " " 24th
15 " .06 " " 19th, 24th, 31st
20 " .09 " " 19th
30 " .13 " " 19th
1 hour .20 " " 19th
2 " .25 " " 19th

GROWING SEASON

(Based on observations from 1894 to 1944, inclusive)

Average date of latest killing frost in spring. . . . May 15
" " first killing frost in autumn September 24
" length of growing season, days. 132

#Previous Day

Contact. 694.0 Hours
Instrument 50.0 "

WEATHER BUREAU

MONTHLY METEOROLOGICAL SUMMARY

STATION Billings, Montana (Municipal Airport)MONTH June, 1945

DATE	TEMPERATURE °F					PRECIPITATION				WIND			WEATHER	
	MAXIMUM	MINIMUM	MEAN	DEPARTURE FROM NORMAL	DEGREE DAYS BASE 65°	TOTAL	(INCHES)	SNOWFALL (INCHES) P. M. TO P. M. (UNMELTED)	DEPTH OF SNOW ON THE GROUND P. M. *	PREVAILING DIRECTION	HIGHEST VELOCITY	DIRECTION	PERCENT OF POSSIBLE SUNSHINE	AVERAGE CLOUDINESS SCALE 0 TO 10
1..	63	49	56	- 4	9	.15	0	0	0	NW	27	NW	74	8
2..	67	47	57	- 4	8	.20	0	0	0	NE	25	N	80	6
3..	70	45	58	- 3	7	.05	0	0	0	N	23	SE	68	9
4..	58	44	51	-10	14	.05	0	0	0	NE	24	NE	56	9
5..	52	41	46	-16	19	.53	0	0	0	NE	27	NE	42	9+
6..	52	42	47	-15	18	.29	0	0	0	NW	24	NW	53	9+
7..	55	43	49	-13	16	T	0	0	0	NE	13	NE	53	9
8..	64	46	55	- 7	10	.01	0	0	0	NE	17	E	68	8
9..	70	44	57	- 6	8	.11	0	0	0	W	17	SW	87	6
10..	57	50	54	- 9	11	.15	0	0	0	SW	22	NW	13	9+
11..	69	47	58	- 5	7	.02	0	0	0	SW	25	NW	81	8
12..	64	48	56	- 8	9	T	0	0	0	SW	21	N	72	9
13..	61	45	53	-11	12	T	0	0	0	NW	29	SW	70	7
14..	58	39	48	-16	17	T	0	0	0	SW	34	N	81	6
15..	59	40	50	-15	15	.06	0	0	0	SW	30	NE	65	9
16..	67	40	54	-11	11	T	0	0	0	SW	29	NW	76	6
17..	67	48	58	- 8	7	T	0	0	0	NW	34	NW	74	6
18..	79	46	62	- 4	3	0	0	0	0	SW	29	NW	93	6
19..	76	56	66	0	0	T	0	0	0	NE	14	NE	84	9
20..	83	56	70	+ 4	0	0	0	0	0	SW	21	NW	93	9+
21..	92	60	76	+ 9	0	0	0	0	0	SW	17	SE	95	2
22..	91	63	77	+10	0	T	0	0	0	SW	47	NW	88	9
23..	72	60	66	- 1	0	T	0	0	0	NE	17	NE	78	8
24..	69	56	62	- 6	3	T	0	0	0	NE	17	NE	62	9
25..	82	54	68	0	0	.08	0	0	0	SW	35	NW	89	5
26..	79	57	68	0	0	.17	0	0	0	SW	26	NW	65	9
27..	64	47	56	-12	9	.29	0	0	0	SW	25	NW	66	9
28..	61	47	54	-15	11	T	0	0	0	NW	26	NW	40	9
29..	66	44	55	-14	10	T	0	0	0	SW	25	N	49	7
30..	66	48	57	-12	8	.05	0	0	0	SW	27	NW	37	8
31..														
MEAN	67.8	48.4	58.1		a242	a2.21	a 0	0	0	SW	b 47	b NW	68	7.7
Normal	-	-	64.9			-	-	-	-	-	22d	-	-	-

...105...TH MERIDIAN TIME. T INDICATES A TRACE OF PRECIPITATION ^aTOTAL ^bMONTHLY.^cSUNRISE TO SUNSET: 0 TO 3, CLEAR; 4 TO 7, PARTLY CLOUDY; 8 TO 10, CLOUDY.

* 5:30 p.m. (#) Midnight to Midnight SUMMARY

BAROMETRIC PRESSURE (SEA LEVEL)

Monthly mean 29.88Highest 30.33, date 30thLowest 29.50, date 26th

TEMPERATURE

Highest 92, date 21stLowest 39, date 14thExtremes this month since 1935: highest 102, on 23rd, 27thin 1936; lowest 32, on 3rd, in 1943Average daily departure -6.8Average daily departure since January 1, -0.8

PRECIPITATION

Greatest amount in 24 hours 0.53, date 5thDeparture from normal this month -Accumulated departure since -Snowfall, greatest 24-hour amount -, date -

WIND

Prevailing direction SW, average hourly velocity 11.5Highest wind velocity this month since 193957 miles from N, on 23rd, in 1939

WEATHER

Number of days clear 1, partly cloudy 9, cloudy 20with measurable precipitation (0.01 inch, or more) 15

MISCELLANEOUS PHENOMENA—DATES OF

Hail 9, 15Fog, light 3, 4, 5, 6, 9, 10, 25Fog, heavy 3, 4, 5, 9, 25Frost, light -, heavy -, killing† -Sleet -Thunderstorms 1, 2, 11, 22, 25, 26, 29, 30Duststorms -

†Frosts not recorded in autumn after first "killing", except in Florida and along immediate coast of the Gulf of Mexico.

MEAN TEMPERATURE AND TOTAL PRECIPITATION THIS MONTH IN—

1875	87		99	64	--	11	66	1.59	23	63	2.68	35	64	0.80	
1876	88		00	74	--	12	64	0.73	24	61	1.74	36	70	1.80	
1877	89		01	60	--	13	66	2.15	25	64	3.11	37	64	4.93	
1878	90		02	62	--	14	61	4.31	26	63	0.67	38	67	5.23	
1879	91		03	60	--	15	58	5.22	27	64	3.34	39	60	5.31	
1880	92		04	--	--	16	61	2.50	28	59	1.67	40	67	2.49	
1881	93	58	2.83	05	62	5.31	17	61	2.17	29	63	1.06	41	64	3.09
1882	94	67	3.81	06	64	0.82	18	70	0.83	30	64	0.79	42	60	2.30
1883	95	61	3.08	07	62	1.17	19	69	0.36	31	69	0.79	43	60	3.28
1884	96	70	1.33	08	63	1.40	20	63	1.80	32	64	4.58	44	59	7.64
1885	97	64	2.61	09	63	2.89	21	69	2.42	33	71	0.40	45	58	2.21
1886	98	63	4.59	10	67	0.50	22	68	2.40	34	66	2.52	46		

Data prior to 1935 from records taken in City of Billings, L. T. Pierce,

subsequent data from records at Airport.

Meteorologist, Weather Bureau.

UNITED STATES DEPARTMENT OF COMMERCE
WEATHER BUREAU

STATION Billings, Montana DATE June, 1945 WB Form 1030
(Municipal Airport)

Psychrometric Data

Date	11:30 p.m.				5:30 a.m.				11:30 a.m.				5:30 p.m.			
	Dry	Wet	Dew Pt.	Rel Hum	Dry	Wet	Dew Pt.	Rel Hum	Dry	Wet	Dew Pt.	Rel Hum	Dry	Wet	Dew Pt.	Rel Hum
1	56.3	51.2	47	72	53.3	49.1	46	76	62.5	53.5	47	57	50.0	50.0	50	100
2	52.6	51.9	51	97	47.9	47.0	46	95	61.5	54.1	49	64	56.8	52.6	50	77
3	50.8	49.8	49	94	45.2	45.2	45	100	63.0	57.1	53	71	60.0	50.8	43	54
4	55.1	51.9	50	82	49.9	49.9	50	100	57.4	54.6	53	84	53.3	49.9	47	80
5	45.7	45.7	46	100	42.0	42.0	42	100	46.8	46.8	47	100	51.0	48.2	46	83
6	44.8	44.8	45	100	42.3	42.3	42	100	46.2	45.4	45	94	48.6	46.8	45	88
7	45.0	44.5	44	96	43.9	43.3	43	96	51.2	48.7	47	85	54.0	50.4	48	79
8	49.7	48.9	48	95	47.9	47.5	47	97	57.2	53.2	50	78	56.8	53.5	51	81
9	50.6	49.9	49	96	45.8	45.8	46	100	56.2	51.4	48	74	69.3	58.6	52	54
10	58.5	53.5	50	73	50.8	50.0	49	95	50.9	50.3	50	97	55.5	53.4	52	88
11	52.5	51.5	51	94	47.9	46.9	46	94	65.1	56.4	51	59	68.4	58.7	53	57
12	56.5	50.8	46	69	51.2	47.0	43	74	58.8	49.0	40	51	61.5	54.1	49	63
13	48.4	47.5	47	94	48.3	43.0	38	66	55.6	44.3	32	41	56.5	45.0	33	41
14	45.0	40.2	35	67	39.8	35.9	31	70	55.1	44.9	34	46	54.8	46.8	39	56
15	42.5	40.8	39	87	41.9	40.7	39	91	53.1	46.9	41	64	54.2	48.2	43	66
16	45.4	43.9	42	89	41.5	40.5	40	92	60.9	51.4	44	56	60.3	51.8	45	58
17	54.2	49.8	46	75	50.0	45.3	41	71	59.9	50.0	42	51	66.6	55.0	47	49
18	55.0	49.8	46	72	47.1	44.7	43	84	70.2	57.2	49	46	76.6	59.0	47	36
19	63.8	56.6	52	65	58.7	53.6	50	73	69.1	59.8	54	59	75.0	62.6	56	52
20	62.5	57.6	55	76	56.4	54.8	54	91	75.9	61.4	53	45	83.1	65.2	56	39
21	71.4	61.9	57	60	59.7	55.2	52	76	82.8	66.9	59	45	90.0	71.8	63	41
22	76.3	65.8	61	59	70.0	60.6	55	59	84.1	70.1	64	51	88.1	71.0	64	44
23	64.0	61.8	61	89	60.0	58.5	58	92	67.2	59.8	56	66	70.1	60.2	55	58
24	63.9	58.9	56	76	56.5	55.1	54	92	57.2	54.2	52	84	67.9	62.0	59	93
25	59.1	57.0	56	88	54.8	54.4	54	97	71.8	64.1	60	67	78.8	68.7	64	61
26	59.0	56.8	55	88	63.9	56.8	52	65	65.0	61.1	59	81	71.8	60.4	54	53
27	58.1	56.1	55	88	50.6	49.9	49	95	50.0	47.1	45	82	60.5	50.3	42	50
28	48.2	44.0	40	73	49.1	45.0	41	73	57.9	50.0	44	62	59.0	50.2	43	55
29	49.8	46.7	44	81	46.2	42.8	40	78	63.2	51.3	42	45	56.6	50.0	45	64
30	50.0	47.8	46	86	48.6	46.8	45	87	51.5	48.8	47	84	65.1	51.9	41	41
31																
Mean	54.5	51.2	49	83	50.4	48.0	46	86	60.9	53.7	49	66	64.0	55.2	49	61

Previous Day

FLYING WEATHER

Contact. 671.0 Hours
Instrument 49.0 "

MAXIMUM AMOUNTS OF PRECIPITATION BY PERIODS

Maximum Precipitation in 5 minutes .09 June 9th
10 " .10 June 9th
15 " .10 June 9th
20 " .10 June 1st and 9th
30 " .13 June 1st
1 hour .16 June 2d and 5th
2 hours .27 June 5th

GROWING SEASON

(Based on observations from 1894 to 1944, inclusive)

Average date of latest killing frost in spring. . . . May 15
" " " first killing frost in autumn September 24
" length of growing season, days. 132

U.S. DEPARTMENT OF COMMERCE
WEATHER BUREAU
MONTHLY METEOROLOGICAL SUMMARY

STATION Billings, Montana (Municipal Airport) MONTH July, 1945

DATE	TEMPERATURE ° F					PRECIPITATION				WIND		WEATHER		
	MAXIMUM	MINIMUM	MEAN	DEPARTURE FROM NORMAL	DEGREE DAYS BASE 65°	TOTAL	(INCHES)	SNOWFALL (INCHES) P. M. TO P. M. (UNMELTED)	DEPTH OF SNOW ON THE GROUND P. M. #	PREVAILING DIRECTION	b. HIGHEST VELOCITY	DIRECTION	PERCENT OF POSSIBLE SUNSHINE	AVERAGE CLOUDINESS SCALE 0 TO 10
1..	75	47	61	-9	4	0	0	0	0	SW	16	SW	91	3
2..	86	54	70	0	0	T	0	0	0	SW	25	NW	85	3
3..	84	58	71	+1	0	.02	0	0	0	SW	25	SW	81	5
4..	79	49	64	-6	1	.03	0	0	0	NE-NW	34	NE	76	5
5..	75	50	62	-8	3	0	0	0	0	SW	12	NE	85	3
6..	82	49	66	-5	0	0	0	0	0	E	14	E	90	4
7..	85	53	69	-2	0	0	0	0	0	SW	9	SW	79	5
8..	86	56	71	0	0	0	0	0	0	SW	25	N	76	4
9..	74	58	66	-5	0	0	0	0	0	NE	18	NE	75	5
10..	84	56	70	-2	0	0	0	0	0	N	14	NE	80	6
11..	85	62	74	+2	0	.12	0	0	0	SW	23	N	54	7
12..	85	57	71	-1	0	.51	0	0	0	SW	20	SW	66	6
13..	89	59	74	+2	0	0	0	0	0	SW	16	SW	98	2
14..	88	61	74	+2	0	T	0	0	0	SW	31	SW	52	7
15..	80	60	70	-2	0	T	0	0	0	SW	24	SW	41	9
16..	89	59	74	+2	0	0	0	0	0	SW	25	NW	92	2
17..	86	58	72	-1	0	T	0	0	0	NE	42	NW	64	7
18..	82	54	68	-5	0	T	0	0	0	NE	29	N	80	5
19..	86	59	72	-1	0	0	0	0	0	NE	14	N	64	7
20..	92	64	78	+5	0	T	0	0	0	SW	24	SW	63	7
21..	98	60	79	+6	0	0	0	0	0	SW	24	NW	85	3
22..	97	64	80	+7	0	0	0	0	0	SW	16	N	99	1
23..	93	63	78	+5	0	0	0	0	0	SW	11	SW	96	2
24..	91	69	80	+7	0	T	0	0	0	NE	20	NW	79	4
25..	98	62	80	+7	0	T	0	0	0	SW	26	SW	83	3
26..	87	66	76	+3	0	0	0	0	0	NE	19	NE	91	2
27..	88	59	74	+1	0	0	0	0	0	NE	17	NE	100	1
28..	94	60	77	+4	0	T	0	0	0	SW	12	NW	82	5
29..	95	67	81	+8	0	T	0	0	0	SW	38	NW	88	3
30..	96	59	78	+5	0	T	0	0	0	SW	45	NW	91	3
31..	86	60	73	0	0	0	0	0	0	NE	15	N	100	0
MEAN	86.9	58.5	72.7		8	0.68	0	0	0	SW	45	NW	80	4.2
Normal	-	-	72.0			-	-	-	-	-	30th	-	-	-

105 TH MERIDIAN TIME. T INDICATES A TRACE OF PRECIPITATION *TOTAL MONTHLY b. for 5-minute period

°SUNRISE TO SUNSET: 0 TO 3, CLEAR; 4 TO 7, PARTLY CLOUDY; 8 TO 10, CLOUDY.

* 5:30 p.m. # Midnight to Midnight SUMMARY

BAROMETRIC PRESSURE (SEA LEVEL)

Monthly mean 29.92
Highest 30.35, date 1st
Lowest 29.63, date 28th

TEMPERATURE

Highest 98, date 21st
Lowest 47, date 1st
Extremes this month since 1935: highest 106, on 4th in 1937; lowest 48, on 17th in 1943
Average daily departure +0.7
Average daily departure since January 1, -0.6

PRECIPITATION

Greatest amount in 24 hours 0.51, date 12th
Departure from normal this month -
Accumulated departure since -
Snowfall, greatest 24-hour amount -, date -

WIND

Prevailing direction SW, average hourly velocity 9.5
Highest wind velocity this month since 1939
61 miles from NW, on 9th in 1940

WEATHER

Number of days clear 14, partly cloudy 16, cloudy 1
with measurable precipitation (0.01 inch, or more) 4

MISCELLANEOUS PHENOMENA—DATES OF

Hail 11, 12
Fog, light 0
Fog, heavy 0
Frost, light -, heavy -, killing -
Sleet 0
Thunderstorms 2, 3, 4, 11, 12, 14, 15, 19,
20, 25
Duststorms 0

†Frosts not recorded in autumn after first "killing", except in Florida and along immediate coast of the Gulf of Mexico.

MEAN TEMPERATURE AND TOTAL PRECIPITATION THIS MONTH IN—

1875		87		99.72	-	11.67	0.90	23.75	2.41	35.76	1.90	
1876		88		00.75	-	12.66	3.39	24.69	1.96	36.81	0.96	
1877		89		01.78	-	13.67	1.27	25.72	1.80	37.76	0.67	
1878		90		02.70	-	14.72	0.87	26.72	0.37	38.72	2.07	
1879		91		03.66	-	15.64	2.61	27.69	1.51	39.74	0.11	
1880		92		04.73	-	16.72	3.13	28.69	2.27	40.75	0.53	
1881		93		05.70	0.61	17.74	1.00	29.72	0.95	41.73	1.17	
1882		94	72	0.43	06.75	0.30	18.68	1.63	30.72	1.20	42.72	0.56
1883		95	70	0.51	07.69	1.63	19.72	0.75	31.72	0.58	43.72	0.48
1884		96	74	0.81	08.70	0.23	20.74	0.55	32.72	0.42	44.69	1.29
1885		97	68	0.78	09.70	2.16	21.74	0.79	33.75	0.38	45.73	0.68
1886		98	72	1.41	10.72	0.65	22.70	2.24	34.74	1.17	46.	

Data prior to 1935 from records taken in City of Billings. L. T. Pierce,

Subsequent data from records at Airport.

Meteorologist.

Weather Bureau.

UNITED STATES DEPARTMENT OF COMMERCE
WEATHER BUREAU

STATION Billings, Montana DATE July, 1945 WB Form 1030
(Municipal Airport)

Psychrometric Data

Date	11:30 p.m.				5:30 a.m.				11:30 a.m.				5:30 p.m.			
	Dry	Wet	Dew Pt.	Rel Hum	Dry	Wet	Dew Pt.	Rel Hum	Dry	Wet	Dew Pt.	Rel Hum	Dry	Wet	Dew Pt.	Rel Hum
1	54.8	50.0	46	73	46.9	45.0	43	88	67.1	55.8	48	51	74.6	58.1	47	38
2	62.0	55.4	51	67	55.1	48.6	43	64	80.0	61.3	50	35	85.0	63.8	52	32
3	66.8	56.2	49	53	60.0	53.1	48	65	78.4	59.9	48	34	74.1	60.1	52	45
4	66.8	57.9	52	60	60.4	50.0	41	49	72.5	57.8	48	42	70.1	57.9	50	49
5	53.7	52.2	51	91	50.7	49.8	49	94	66.1	56.2	50	56	75.1	58.4	47	37
6	62.8	53.4	47	55	50.2	47.8	46	85	75.0	58.4	48	38	80.1	60.0	47	31
7	68.6	55.8	47	46	55.0	50.8	47	76	76.9	62.2	54	45	84.2	63.3	51	32
8	71.0	60.9	55	58	56.1	53.0	51	83	82.1	60.8	47	30	85.4	62.4	48	27
9	66.2	56.8	51	58	57.7	54.0	51	79	67.3	59.0	54	63	72.0	61.2	55	55
10	61.5	56.2	53	73	57.2	53.9	52	82	75.1	63.3	57	54	81.0	66.2	59	47
11	71.5	63.5	59	66	64.0	58.8	56	75	82.8	65.9	57	42	75.1	62.9	56	50
12	66.1	60.0	56	71	58.2	55.8	54	86	75.8	64.9	60	58	72.1	64.8	61	69
13	67.6	62.1	59	75	60.0	56.2	54	80	79.1	68.3	64	80	89.1	70.3	62	41
14	74.3	62.7	56	54	62.2	58.4	56	80	82.6	67.3	60	47	72.5	63.8	60	64
15	64.8	59.3	56	73	60.0	56.1	54	80	75.0	63.2	57	59	73.2	60.9	54	50
16	65.2	59.9	57	74	60.0	56.1	54	80	77.0	63.3	56	48	88.9	65.5	53	30
17	69.2	59.0	53	56	60.1	55.2	52	75	74.1	62.3	56	53	73.7	61.0	54	50
18	61.8	56.9	54	75	55.0	54.8	55	99	73.5	63.2	58	59	80.7	65.8	58	48
19	65.1	59.7	57	74	60.8	58.1	56	85	73.8	65.0	61	64	85.6	69.8	63	47
20	74.8	66.9	63	68	66.6	61.0	58	74	82.8	70.0	64	53	84.1	68.4	61	46
21	72.8	60.7	53	51	63.1	56.8	53	69	84.9	69.2	62	46	96.1	68.7	55	25
22	76.3	63.1	56	49	64.9	58.0	54	68	88.2	68.6	59	38	97.2	70.0	57	26
23	78.2	58.9	46	32	66.1	56.0	49	54	86.9	66.6	56	35	91.8	66.3	53	27
24	81.1	63.1	53	38	70.3	58.9	52	52	82.6	62.4	50	33	91.0	67.3	55	30
25	74.1	62.1	55	52	65.3	59.0	55	70	85.7	69.8	63	47	93.3	70.2	59	32
26	80.5	65.0	57	45	67.9	57.9	51	54	81.2	65.1	57	43	85.3	65.0	54	35
27	71.6	58.1	49	45	62.1	53.8	48	59	81.9	64.0	54	39	85.5	64.4	53	33
28	74.4	59.9	51	44	62.0	55.1	50	66	81.8	65.0	56	42	90.6	68.5	58	34
29	78.7	60.2	48	34	67.2	57.5	51	57	87.0	64.3	51	30	93.8	68.0	55	27
30	74.6	61.3	54	49	59.9	55.9	53	79	88.9	69.1	60	38	85.2	65.0	54	35
31	70.4	60.0	54	56	60.0	48.5	38	44	77.0	58.1	45	32	85.2	61.8	47	27
Mean	69.3	59.3	53	59	60.2	54.6	51	73	78.8	63.6	55	46	83.0	64.5	55	39

Previous Day

MAXIMUM AMOUNTS OF PRECIPITATION BY PERIODS

Maximum precipitation in 5 minutes .17; in 10 minutes .30; in 15 minutes .32; in 20 minutes .32; in 30 minutes .32; in 1 hour .51; in 2 hours .51, all amounts on July 12.

CEILING AND VISIBILITY FREQUENCIES FOR JULY, 1945
(Based on hourly record observations at Municipal Airport)

Visibility (Miles)	C E I L I N G (f e e t)									
	0	100- 200	300- 400	500- 900	1000- 1900	2000- 2900	3000- 4900	5000- 9500	Over 9500	Total
0 to 1/8										
3/16 to 3/8										
1/2 to 3/4										
1 to 2 1/2										
3 to 6							1			1
7 to 15								1		1
20 to 30							2	33	199	234
35 or more							2	27	479	508
Total							5	60	679	744

GROWING SEASON

(Based on observations from 1894 to 1944, inclusive)

Average date of latest killing frost in spring. . . . May 15
Average date of first killing frost in autumn September 24
Average length of growing season, days. 132