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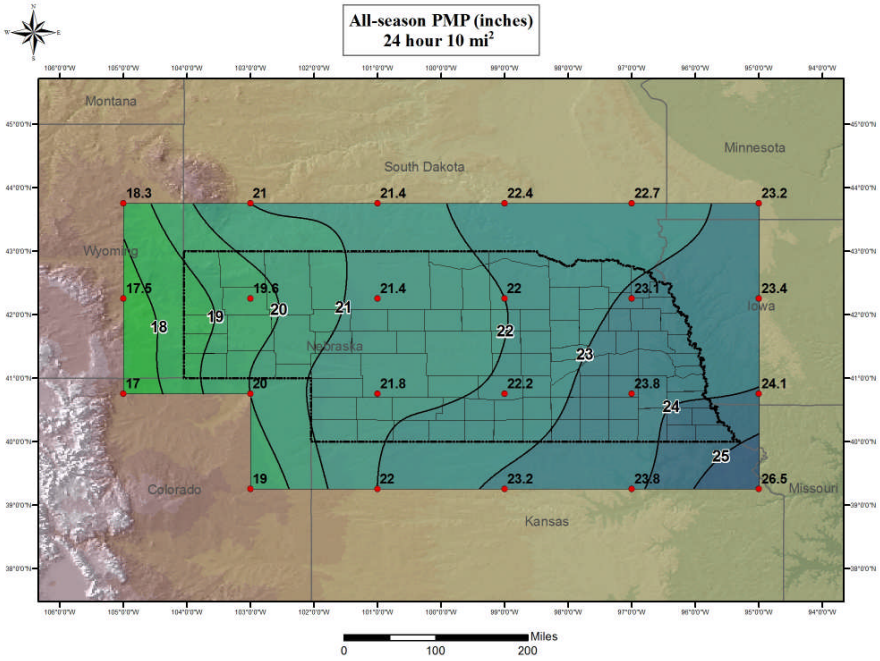
Site-Specific Probable Maximum Precipitation (PMP) Study for Nebraska

Appendix F
Short Storm List Storm Analyses



Prepared for
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Wahoo, Nebraska

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December 2008

Appendix F:

Short Storm List Storm Analyses

Storm files were made for thirty-six storms (Table F.1). Ten of these storms were analyzed (or re-analyzed) for this study using SPAS (identified by an * in Table F.1), while storm analyses were performed for the other storms based on available data from previously published reports (HMR 51 and/or EPRI). The 1.50 limitation on in-place storm maximization as detailed in HMRs 51 and 55A was followed in the report and is noted in several of the storm spreadsheets. Note that in the storm analyses, only one example spreadsheet for one grid point is shown for each storm although a spreadsheet was constructed and analyzed for each grid point where that storm was transpositioned.

Table F.1 Nebraska Statewide PMP Short Storm List (alphabetical listing)

Station Name	St	Lat	Lon	Duration	Year	Month	Day	Max Precip
AURORA COLLEGE*	IL	41.75	-88.3333	1-day	1996	7	17	18.24
BEAULIEU	MN	47.3	-95.9	6hrs	1909	7	18	11.50
BONAPARTE	IA	40.7667	-91.75	6hrs	1905	6	10	12.10
BOYDEN	IA	43.19	-96.01	6hrs	1926	9	17	24.00
CHEYENNE	OK	35.61	-99.67	6hrs	1934	4	3	23.00
COLE CAMP	MO	38.46	-93.2027	3-day	1946	8	12	19.40
COLLINSVILLE	IL	38.6717	-90.5392	3-day	1946	8	12	18.70
COOPER	MI	42.376	-85.610	6hrs	1914	8	31	12.60
COUNCIL GROVE	KS	38.400	-96.300	3-day	1951	7	9	18.50
DAVID CITY*	NE	41.228	-97.109	6hrs	1963	6	24	16.50
EDGERTON	MO	39.5	-94.6167	1-day	1965	7	18	20.02
ENID*	OK	36.4	-97.8833	1-day	1973	10	10	20.00
FOREST CITY*	MN	45.206	-94.466	6hrs	1983	6	20	17.00
GRANT TOWNSHIP	NE	40.390	-99.850	6hrs	1940	6	3	13.00
GREELEY	NE	41.55	-98.5333	6hrs	1896	6	4	12.30
HALE*	CO	39.609	-102.246	6hrs	1935	5	30	18.00
HALLETT	OK	36.2	-96.6	6hrs	1940	9	2	24.00
HAYWARD	WI	46.013	-91.485	1-day	1941	8	28	15.00
HOKAH*	MN	43.812	-91.363	1-day	2007	8	19	18.93
HOLLY*	CO	38.05	-102.117	3-day	1965	6	16	15.54
IDA GROVE	IA	42.3167	-95.4667	1-day	1962	8	30	12.85
IRONWOOD	MI	46.45	-90.1833	3-day	1909	7	21	13.20
LAMBERT	MN	44.230	-95.260	3-day	1897	7	18	8.00
MEDFORD	WI	45.1333	-90.3333	3-day	1905	6	4	11.20
MEEKER	OK	35.503	-96.903	1-day	1908	10	19	16.23
MINNEAPOLIS	MN	44.8833	-93.2167	6hrs	1987	7	23	10.55
OGALLALA*	NE	41.125	-101.717	6hrs	2002	7	6	14.92
PARIS WATERWORKS	IN	39.05	-87.7	6hrs	1957	6	27	13.19
PAWNEE CREEK*	CO	40.67	-103.83	1-day	1997	7	28	13.70
PRAGUE*	NE	41.358	-96.879	6hrs	1959	8	1	13.09
RITTER	IA	43.244	-95.823	6hrs	1953	6	7	11.00
SAVAGETON	WY	43.88	-105.93	1-day	1923	9	27	17.10
SPRINGBROOK	MT	47.25	-104.52	1-day	1921	6	17	14.60
STANTON	NE	41.867	-97.05	6hrs	1944	6	10	17.30
TOMAH	WI	43.98	-90.5	6hrs	1990	8	17	9.17
WARNER	OK	35.49	-95.31	3-day	1943	5	6	25.00

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Aurora College, IL July 17, 1996 6-Hour Analysis
Storm Type: MCC

Storm Name:	**Aurora College, IL**
Storm Date:	**17-Jul-1996**
AWA Analysis Date:	**12/2/2008**

Storm Adjustment for Nebraska Grid Point 10

Temporal Transposition Date **15-Jul**

	Lat	Long
Storm center location	**41.75 N**	**88.33 W**
Storm Rep dew point location	**40.14 N**	**89.21 W**
Transposition dewpoint location	**37.63 N**	**100.91 W**
Basin location	**41.25 N**	**96.66 W**

Moisture Inflow Direction:	**SSW @ 120**	miles
Basin Elevation	**1,300**	feet
Storm Elevation	**670**	feet
Storm Duration	**6hr**	feet

The storm representative dew point is	**75.0 F**	with total precipitable water above sea level of			**2.85**	inches.
The in-place maximum dew point is	**83.0 F**	with total precipitable water above sea level of			**4.08**	inches.
The transpositioned maximum dew point is	**83.0 F**	with total precipitable water above sea level of			**4.08**	inches.
The in-place storm elevation is	**670**	which subtracts	**0.18**	inches of precipitable water at	**75.0 F**	
The in-place storm elevation is	**670**	which subtracts	**0.24**	inches of precipitable water at	**83.0 F**	
The transposition basin elevation at	**1,300**	which subtracts	**0.41**	inches of precipitable water at	**83.0 F**	
The inflow barrier/basin elevation height is	**1,300**	which subtracts	**0.41**	inches of precipitable water at	**83.0 F**	

The in-place storm maximization factor is	**1.44**
The transposition/elevation to basin factor is	**0.96**
The barrier adjustment factor is	**1.00**
The total adjustment factor is	**1.37**

Notes: DAD values taken from SPAS 1029

Observed Storm Depth-Area-Duration

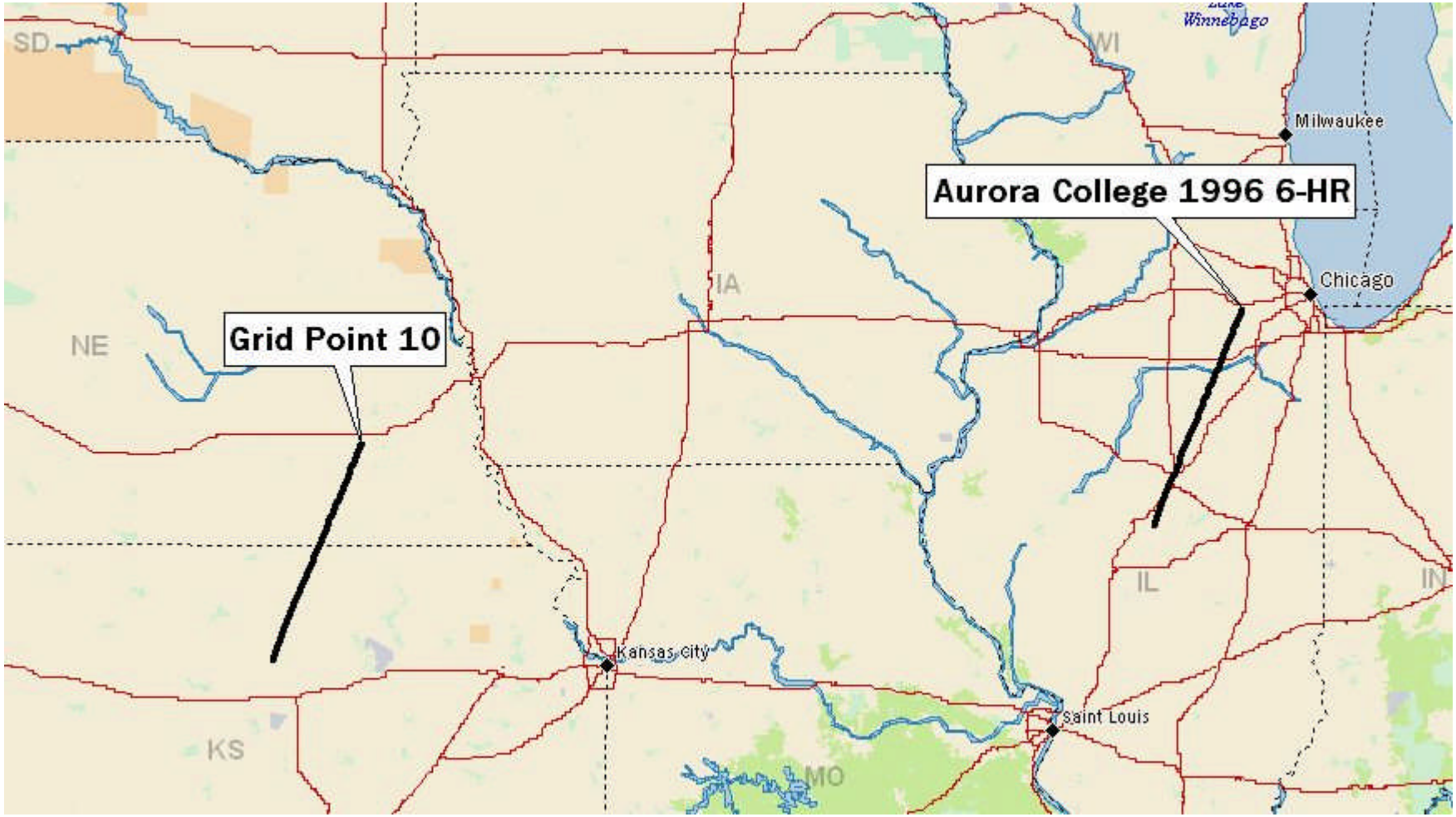
	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**11.0**	**12.2**	**15.5**	**16.9**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
100 sq miles	**9.5**	**10.9**	**14.2**	**15.7**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
200 sq miles	**8.9**	**10.4**	**13.6**	**15.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
500 sq miles	**7.8**	**9.7**	**12.0**	**13.5**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
1000 sq miles	**7.0**	**8.9**	**10.8**	**12.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
5000 sq miles	**4.2**	**5.6**	**7.0**	**8.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
10000 sq miles	**2.6**	**3.8**	**4.9**	**5.6**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
20000 sq miles	**1.5**	**2.3**	**3.0**	**3.6**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Adjusted Storm Depth-Area-Duration

	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**15.2**	**16.8**	**21.3**	**23.3**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
100 sq miles	**13.1**	**15.0**	**19.6**	**21.6**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
200 sq miles	**12.2**	**14.3**	**18.7**	**20.5**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
500 sq miles	**10.7**	**13.3**	**16.5**	**18.5**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
1000 sq miles	**9.6**	**12.3**	**14.9**	**16.5**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
5000 sq miles	**5.8**	**7.8**	**9.7**	**11.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
10000 sq miles	**3.6**	**5.2**	**6.7**	**7.7**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
20000 sq miles	**2.0**	**3.2**	**4.1**	**5.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Storm or Storm Center Name	**Aurora College, IL**
Storm Date(s)	17-Jul-1996
Storm Type	Synoptic-Thunderstorms
Storm Location	41.75 N 88.33 W
Storm Center Elevation	670
Precipitation Total & Duration	18.24 in 24hrs from SPAS 1029, Highest recorded amount was 16.91"
Storm Representative Dewpoint	75.0 F 6hr average 07-17-96 1400 CDT-07-17-96 2100CDT of KSPI, KBMI, KDEC
Storm Representative Dewpoint Location	40.14 N 89.21 W
Maximum Dewpoint	83.0 F
Moisture Inflow Vector	SSW @ 120 Miles
In-place Maximization Factor	1.44
Temporal Transposition (Date)	15-Jul
Transposition Dewpoint Location	37.63 N 100.91 W
Transposition Maximum Dewpoint	83.0 F
Basin Elevation	1,300
Transposition to Basin Adjustment Factor	0.96
Higher of Basin Elevation - Inflow Barrier Height	1,300
Elevation Adjustment Factor	1.00
Total Adjustment Factor	1.37

Aurora College, IL July 17, 1996 6-Hour Inflow Analysis

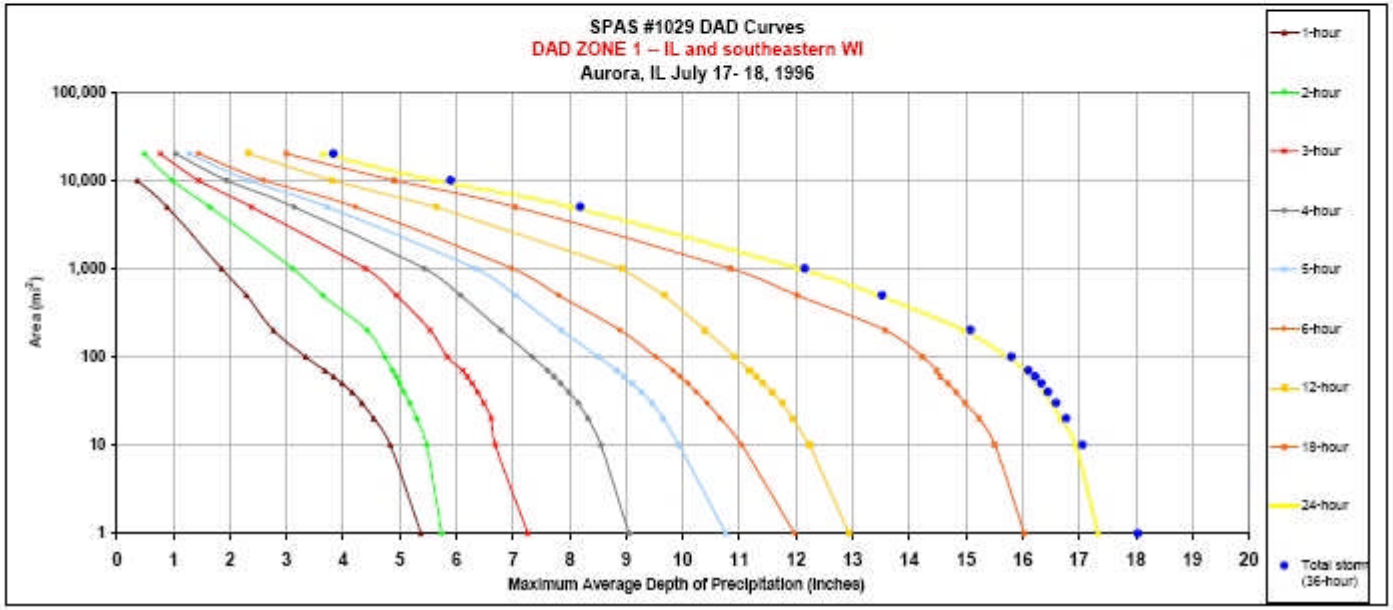


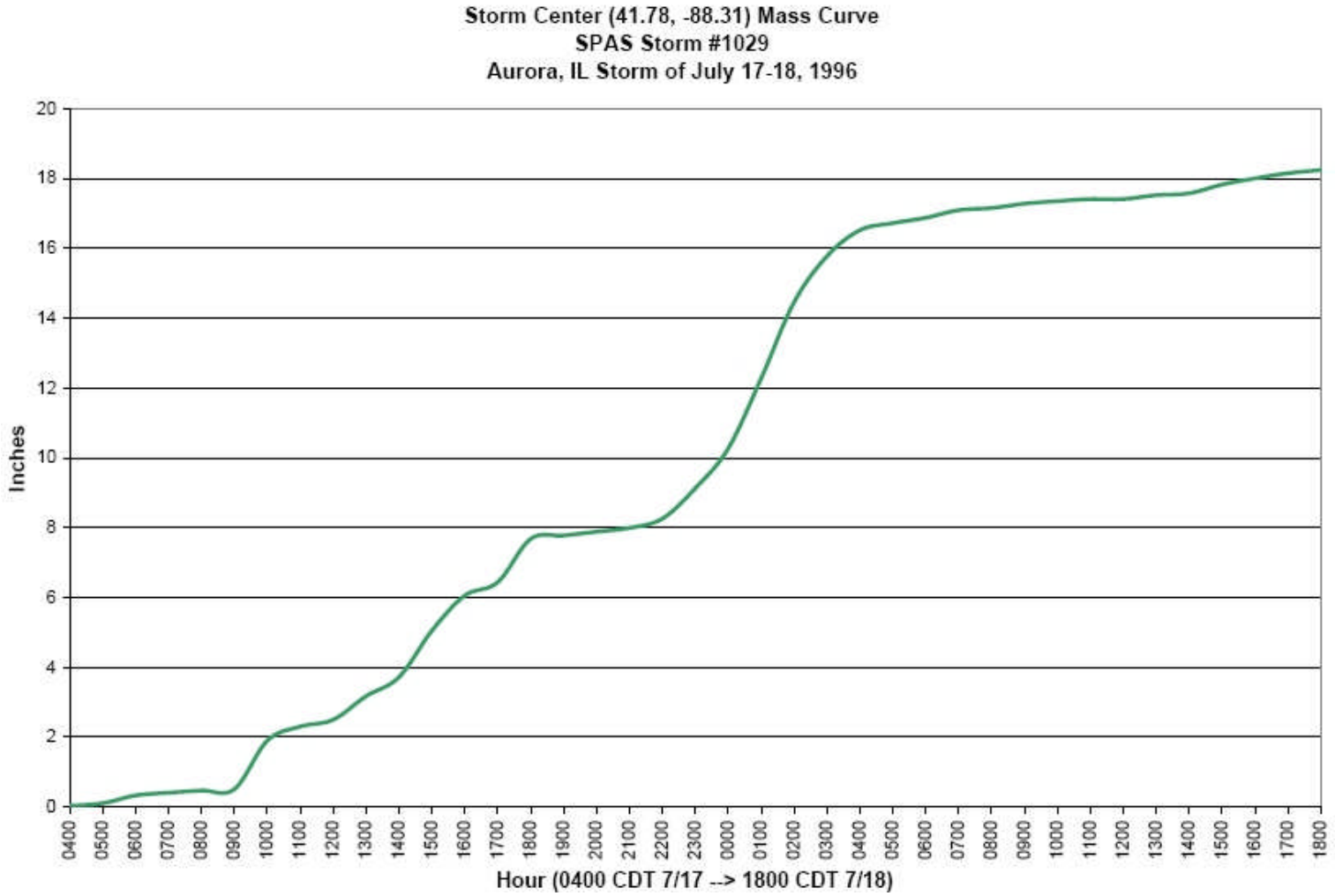
Storm 1029 - Aurora, IL July 17- 18, 1996

MAXIMUM AVERAGE DEPTH OF PRECIPITATION (INCHES)

Area (mi²)	Duration (hours)									
	1	2	3	4	5	6	12	18	24	total (36-hr)
1	5.37	5.74	7.26	9.05	10.76	11.97	12.93	16.03	17.33	18.04
10	4.83	5.47	6.69	8.55	9.93	11.04	12.24	15.51	16.94	17.06
20	4.54	5.30	6.61	8.32	9.65	10.66	11.94	15.23	16.67	16.77
30	4.33	5.18	6.48	8.15	9.45	10.43	11.75	14.98	16.51	16.59
40	4.16	5.07	6.37	7.98	9.27	10.24	11.57	14.82	16.37	16.45
50	3.98	5.00	6.28	7.84	9.10	10.09	11.42	14.68	16.27	16.33
60	3.83	4.94	6.19	7.72	8.96	9.95	11.29	14.54	16.15	16.22
70	3.68	4.87	6.11	7.61	8.83	9.83	11.18	14.48	16.04	16.10
100	3.34	4.74	5.84	7.34	8.51	9.52	10.92	14.23	15.73	15.80
200	2.76	4.42	5.53	6.79	7.85	8.89	10.39	13.57	14.95	15.06
500	2.29	3.64	4.94	6.07	7.04	7.81	9.67	12.02	13.45	13.52
1,000	1.85	3.11	4.39	5.43	6.33	6.96	8.92	10.64	12.04	12.15
5,000	0.89	1.64	2.38	3.13	3.72	4.22	5.64	7.04	8.02	8.19
10,000	0.36	0.98	1.45	1.94	2.33	2.60	3.80	4.90	5.60	5.90
20,000		0.49	0.77	1.04	1.26	1.45	2.33	2.99	3.63	3.63

Total area size = 21,026 sq-mi




Storm Center (41.78, -88.31) Mass Curve
SPAS Storm #1029
Aurora, IL Storm of July 17-18, 1996
Inches
0
2
4
6
8
10
12
14
16
18
20
0400
0500
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1200
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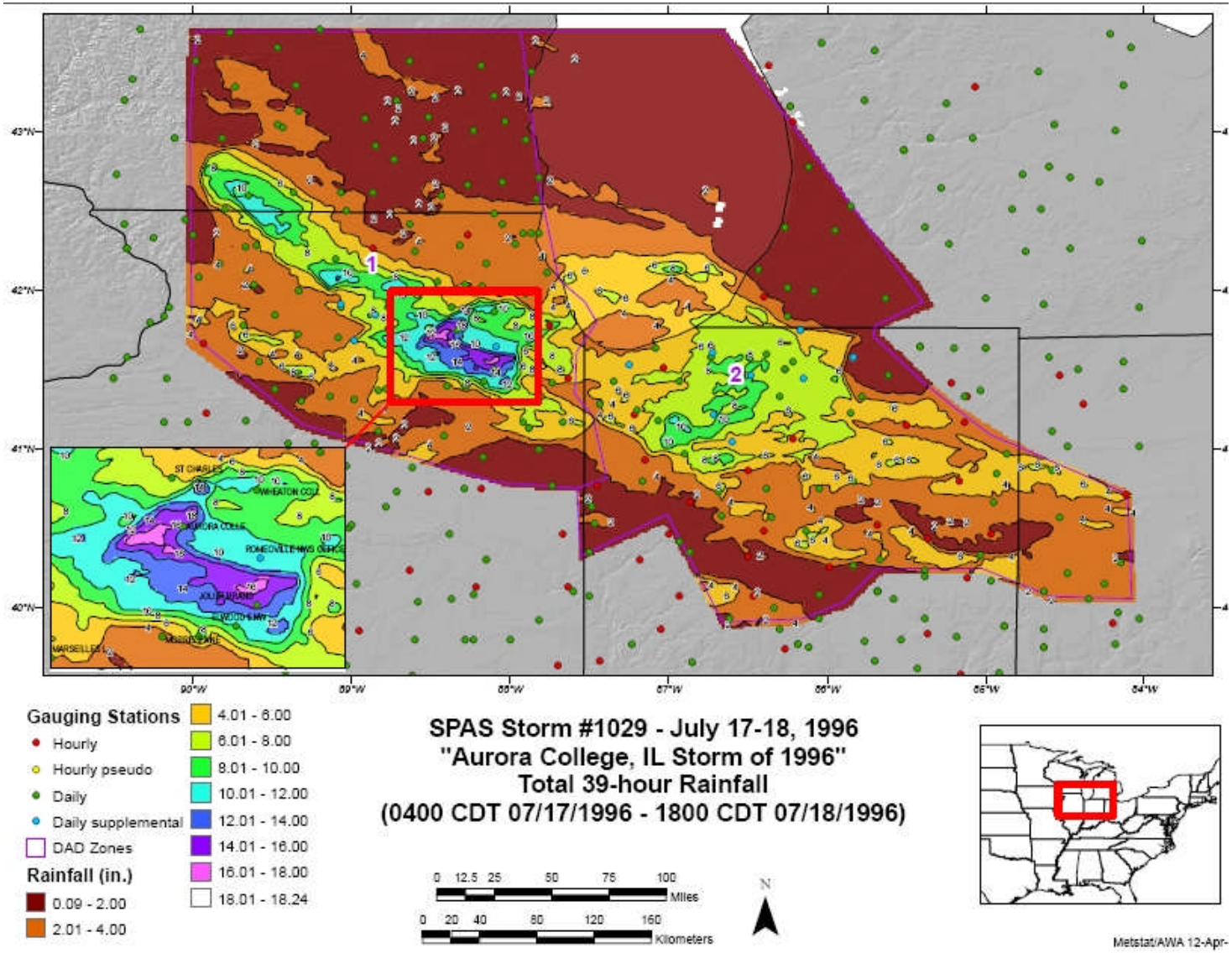
1400
1500
1600
1700
1800
Hour (0400 CDT 7/17 --> 1800 CDT 7/18)


Gauging Stations
Hourly
Hourly pseudo
Daily
Daily supplemental
DAD Zones
Rainfall (in.)
0.09 - 2.00
2.01 - 4.00
4.01 - 6.00
6.01 - 8.00
8.01 - 10.00
10.01 - 12.00
12.01 - 14.00
14.01 - 16.00
16.01 - 18.00
18.01 - 18.24
SPAS Storm #1029 - July 17-18, 1996
"Aurora College, IL Storm of 1996"
Total 39-hour Rainfall
(0400 CDT 07/17/1996 - 1800 CDT 07/18/1996)
0 12.5 25 50 75 100
Miles
0 20 40 80 120 160
Kilometers
N
Metstat/AWA 12-Apr-

Aurora College, IL July 17, 1996 24-Hour Analysis
Storm Type: Hybrid

Storm Name:	**Aurora College, IL**
Storm Date:	**17-Jul-1996**
AWA Analysis Date:	**12/2/2008**

Storm Adjustment for Nebraska Grid Point 10

Temporal Transposition Date **15-Jul**

	Lat	Long
Storm center location	**41.75 N**	**88.33 W**
Storm Rep dew point location	**38.63 N**	**92.24 W**
Transposition dewpoint location	**37.63 N**	**100.91 W**
Basin location	**41.25 N**	**96.66 W**

Moisture Inflow Direction:	**SW @ 300**	miles
Basin Elevation	**1,300**	feet
Storm Elevation	**670**	feet
Storm Duration	**24hr**	feet

The storm representative dew point is	**74.0 F**	with total precipitable water above sea level of			**2.73**	inches.
The in-place maximum dew point is	**79.5 F**	with total precipitable water above sea level of			**3.52**	inches.
The transpositioned maximum dew point is	**78.0 F**	with total precipitable water above sea level of			**3.29**	inches.
The in-place storm elevation is	**670**	which subtracts	**0.17**	inches of precipitable water at	**74.0 F**	
The in-place storm elevation is	**670**	which subtracts	**0.205**	inches of precipitable water at	**79.5 F**	
The transposition basin elevation at	**1,300**	which subtracts	**0.36**	inches of precipitable water at	**78.0 F**	
The inflow barrier/basin elevation height is	**1,300**	which subtracts	**0.36**	inches of precipitable water at	**78.0 F**	

The in-place storm maximization factor is	**1.29**
The transposition/elevation to basin factor is	**0.88**
The barrier adjustment factor is	**1.00**
The total adjustment factor is	**1.14**

Notes: DAD values taken from SPAS 1029

Observed Storm Depth-Area-Duration

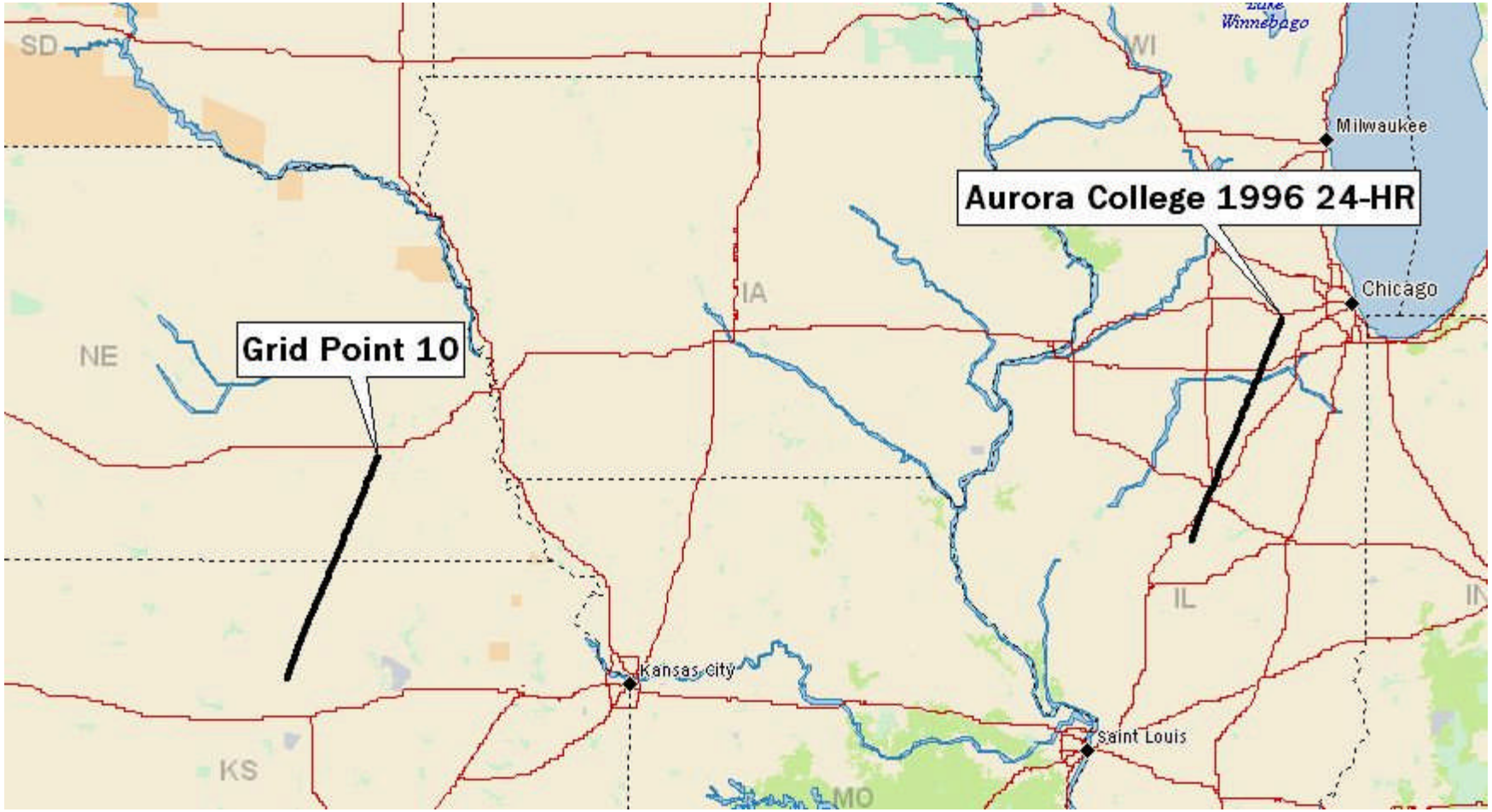
	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**11.0**	**12.2**	**15.5**	**16.9**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
100 sq miles	**9.5**	**10.9**	**14.2**	**15.7**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
200 sq miles	**8.9**	**10.4**	**13.6**	**15.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
500 sq miles	**7.8**	**9.7**	**12.0**	**13.5**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
1000 sq miles	**7.0**	**8.9**	**10.8**	**12.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
5000 sq miles	**4.2**	**5.6**	**7.0**	**8.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
10000 sq miles	**2.6**	**3.8**	**4.9**	**5.6**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
20000 sq miles	**1.5**	**2.3**	**3.0**	**3.6**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Adjusted Storm Depth-Area-Duration

	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**12.6**	**14.0**	**17.8**	**19.4**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
100 sq miles	**10.9**	**12.5**	**16.3**	**18.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
200 sq miles	**10.2**	**11.9**	**15.5**	**17.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
500 sq miles	**8.9**	**11.1**	**13.8**	**15.4**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
1000 sq miles	**8.0**	**10.2**	**12.4**	**13.8**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
5000 sq miles	**4.8**	**6.5**	**8.1**	**9.2**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
10000 sq miles	**3.0**	**4.3**	**5.6**	**6.4**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
20000 sq miles	**1.7**	**2.7**	**3.4**	**4.2**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Storm or Storm Center Name	**Aurora College, IL**	
Storm Date(s)	17-Jul-1996	
Storm Type	Synoptic-Thunderstorms	
Storm Location	41.75 N	88.33 W
Storm Center Elevation	670	
Precipitation Total & Duration	18.24 in 24hrs from SPAS 1029, Highest recorded amount was 16.91 inches	
Storm Representative Dewpoint	74.0 F	24hr average Td from 07-17-96 0000 CDT to 07-17-96 2300 CDT
Storm Representative Dewpoint Location	38.63 N	92.24 W
Maximum Dewpoint	79.5 F	
Moisture Inflow Vector	SW @ 300	
In-place Maximization Factor	1.29	
Temporal Transposition (Date)	15-Jul	
Transposition Dewpoint Location	37.63 N	100.91 W
Transposition Maximum Dewpoint	78.0 F	
Basin Elevation	1,300	
Transposition to Basin Adjustment Factor	0.88	
Higher of Basin Elevation - Inflow Barrier Height	1,300	
Elevation Adjustment Factor	1.00	
Total Adjustment Factor	1.14	

Aurora College, IL July 17, 1996 24-Hour Inflow Analysis

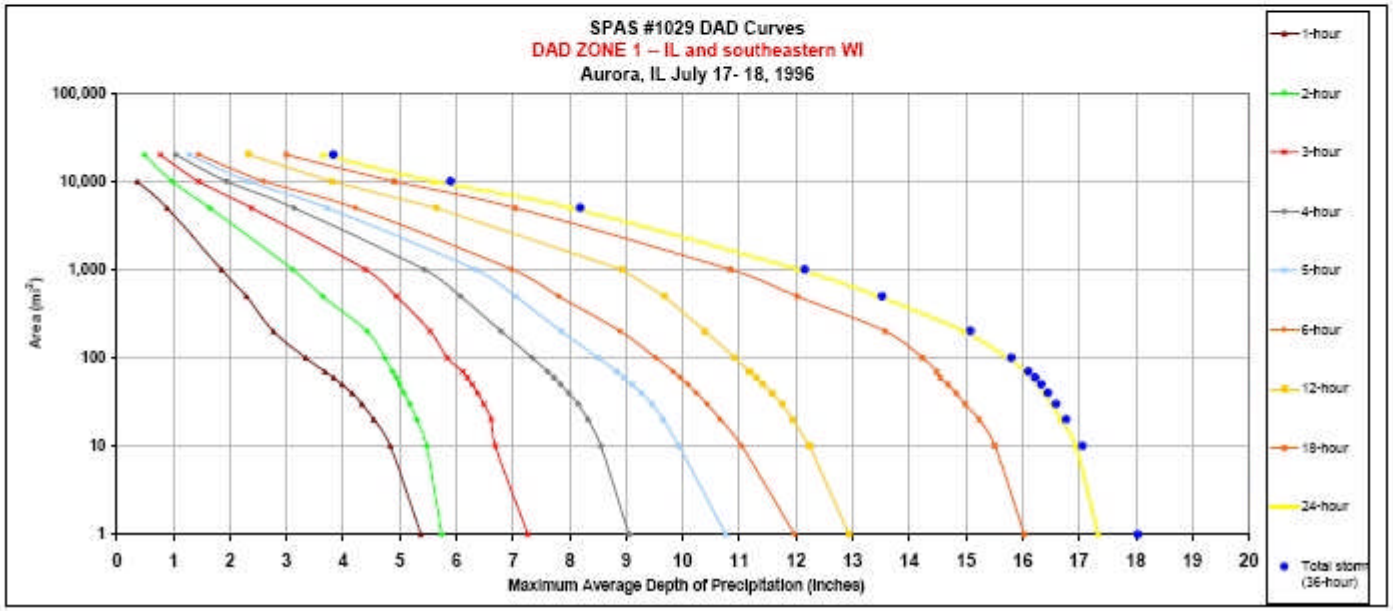


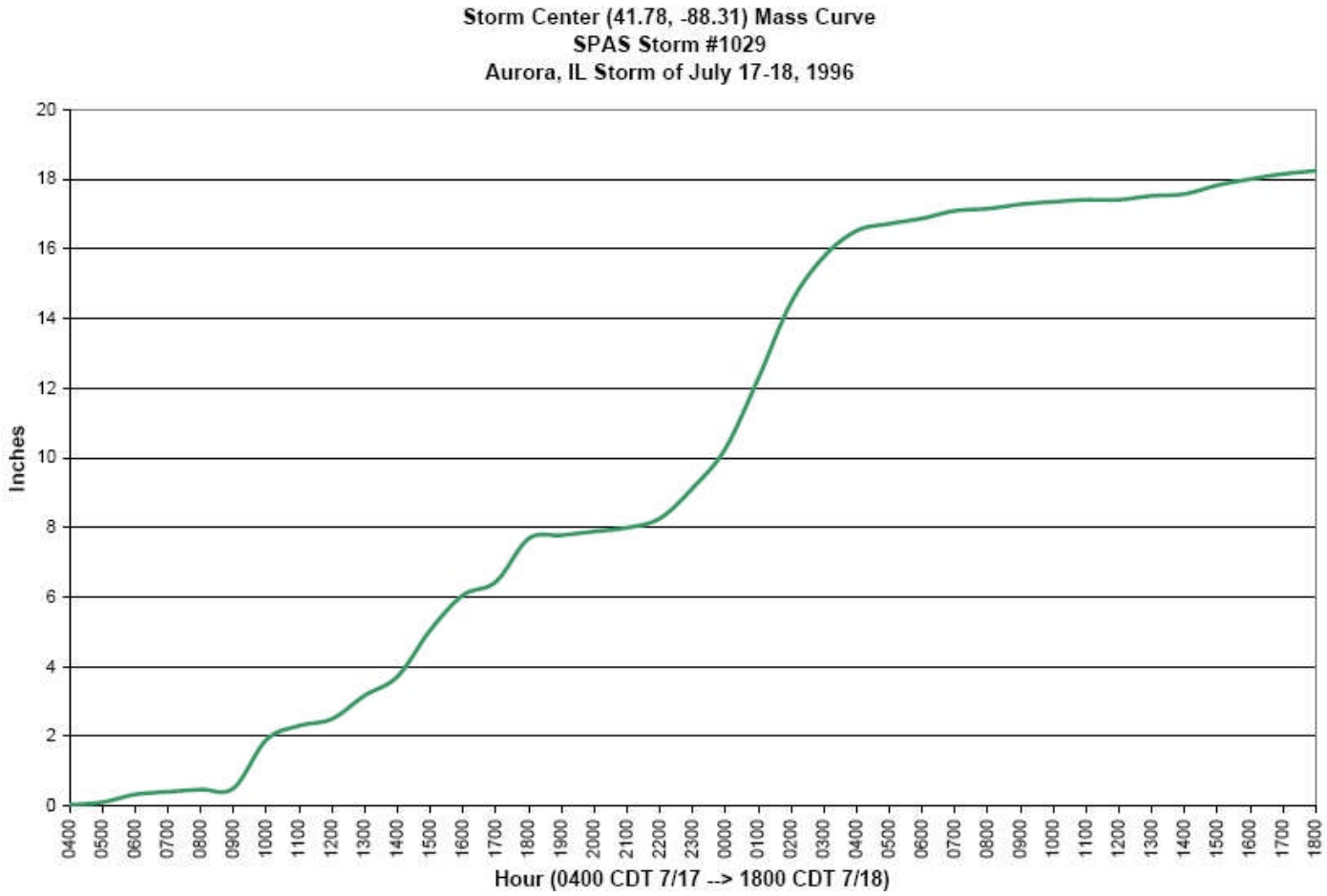
Storm 1029 - Aurora, IL July 17- 18, 1996

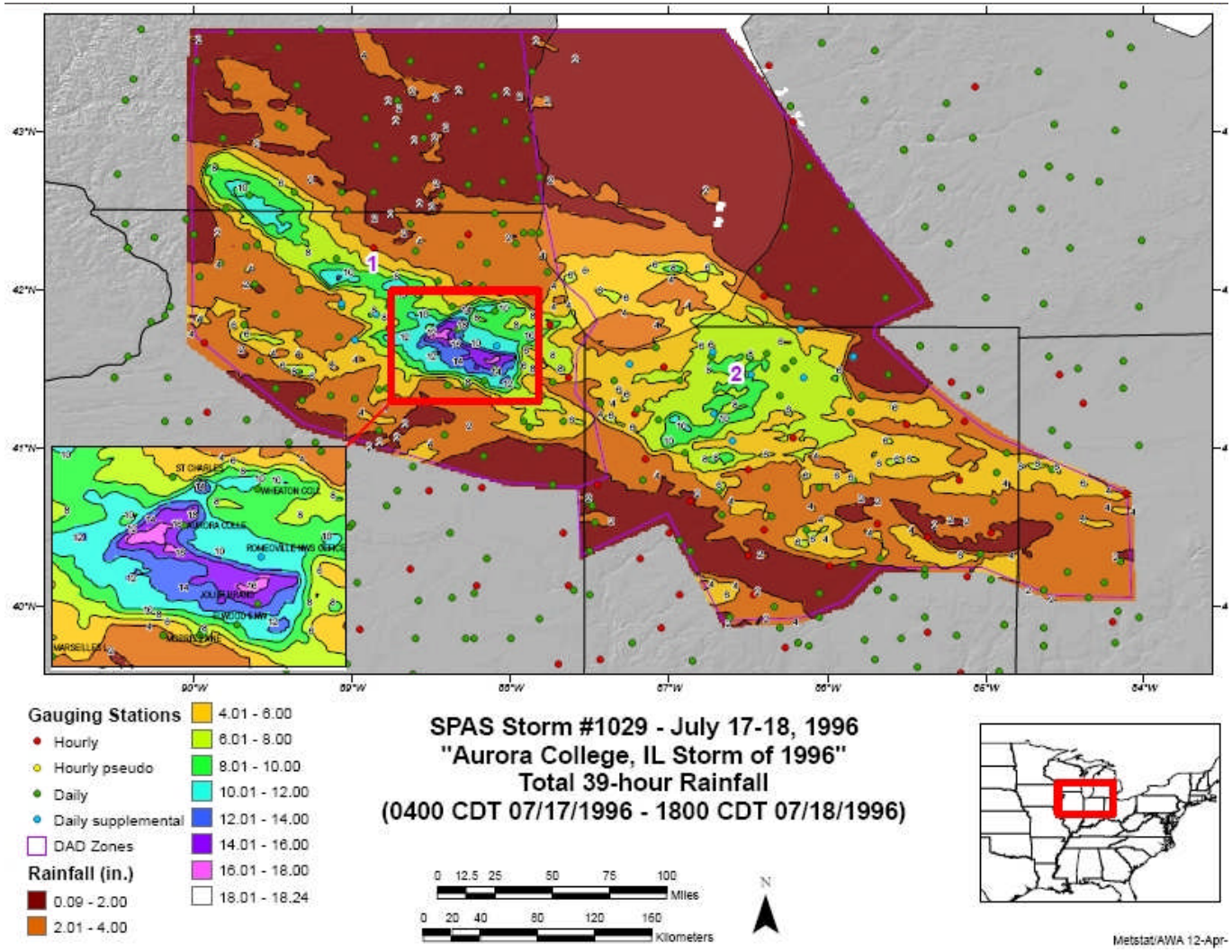
MAXIMUM AVERAGE DEPTH OF PRECIPITATION (INCHES)

Area (mi²)	Duration (hours) 1	2	3	4	5	6	12	18	24	total (36-hr)
1	5.37	5.74	7.26	9.05	10.76	11.97	12.93	16.03	17.33	18.04
10	4.83	5.47	6.69	8.55	9.93	11.04	12.24	15.51	16.94	17.06
20	4.54	5.30	6.61	8.32	9.65	10.66	11.94	15.23	16.67	16.77
30	4.33	5.18	6.48	8.15	9.45	10.43	11.75	14.98	16.51	16.59
40	4.16	5.07	6.37	7.98	9.27	10.24	11.57	14.82	16.37	16.45
50	3.98	5.00	6.28	7.84	9.10	10.09	11.42	14.68	16.27	16.33
60	3.83	4.94	6.19	7.72	8.96	9.95	11.29	14.54	16.15	16.22
70	3.68	4.87	6.11	7.61	8.83	9.83	11.18	14.48	16.04	16.10
100	3.34	4.74	5.84	7.34	8.51	9.52	10.92	14.23	15.73	15.80
200	2.76	4.42	5.53	6.79	7.85	8.89	10.39	13.57	14.95	15.08
500	2.29	3.64	4.94	6.07	7.04	7.81	9.67	12.02	13.45	13.52
1,000	1.85	3.11	4.39	5.43	6.33	6.96	8.92	10.64	12.04	12.15
5,000	0.89	1.64	2.38	3.13	3.72	4.22	5.64	7.04	8.02	8.19
10,000	0.36	0.98	1.45	1.94	2.33	2.60	3.80	4.90	5.60	5.90
20,000		0.49	0.77	1.04	1.28	1.45	2.33	2.99	3.63	3.83

Total area size = 21,026 sq-mi




Storm Center (41.78, -88.31) Mass Curve
SPAS Storm #1029
Aurora, IL Storm of July 17-18, 1996
Inches
0
2
4
6
8
10
12
14
16
18
20
0400
0500
0600
0700
0800
0900
1000
1100
1200
1300
1400
1500
1600
1700
1800
1900
2000
2100
2200
2300
0000
0100
0200
0300
0400
0500
0600
0700
0800
0900
1000
1100
1200
1300
1400
1500
1600
1700
1800
Hour (0400 CDT 7/17 --> 1800 CDT 7/18)


Gauging Stations
Hourly
Hourly pseudo
Daily
Daily supplemental
DAD Zones
Rainfall (in.)
0.09 - 2.00
2.01 - 4.00
4.01 - 6.00
6.01 - 8.00
8.01 - 10.00
10.01 - 12.00
12.01 - 14.00
14.01 - 16.00
16.01 - 18.00
18.01 - 18.24
SPAS Storm #1029 - July 17-18, 1996
"Aurora College, IL Storm of 1996"
Total 39-hour Rainfall
(0400 CDT 07/17/1996 - 1800 CDT 07/18/1996)
0 12.5 25 50 75 100
Miles
0 20 40 80 120 160
Kilometers
N
Metstat/AWA 12-Apr-

Beaulieu, MN July 18. 1909
Storm Type: MCC

Storm Name:	**Beaulieu, MN**
Storm Date:	**18-Jul-1909**
AWA Analysis Date:	**12/2/2008**

Storm Adjustment for Grid Point 10

Temporal Transposition Date **15-Jul**

	Lat	Long
Storm center location	**47.35 N**	**95.80 W**
Storm Rep dew point location	**43.32 N**	**98.08 W**
Transposition dewpoint location	**36.72 N**	**99.28 W**
Basin location	**41.25 N**	**96.66 W**

Moisture Inflow Direction:	**SSW @ 275**	miles
Basin Elevation	**1,300**	feet
Storm Elevation	**1,300**	feet
Storm Duration	**6hr**	feet

The storm representative dew point is	**78.0 F**	with total precipitable water above sea level of			**3.29**	inches.
The in-place maximum dew point is	**83.0 F**	with total precipitable water above sea level of			**4.08**	inches.
The transpositioned maximum dew point is	**82.5 F**	with total precipitable water above sea level of			**4.00**	inches.
The in-place storm elevation is	**1,300**	which subtracts	**0.36**	inches of precipitable water at	**78.0 F**	
The in-place storm elevation is	**1,300**	which subtracts	**0.41**	inches of precipitable water at	**83.0 F**	
The transposition basin elevation at	**1,300**	which subtracts	**0.405**	inches of precipitable water at	**82.5 F**	
The inflow barrier/basin elevation height is	**1,300**	which subtracts	**0.405**	inches of precipitable water at	**82.5 F**	

The in-place storm maximization factor is	**1.25**
The transposition/elevation to basin factor is	**0.98**
The barrier adjustment factor is	**1.00**
The total adjustment factor is	**1.23**

Notes: DAD values taken from USACE UMV 1-11

Observed Storm Depth-Area-Duration

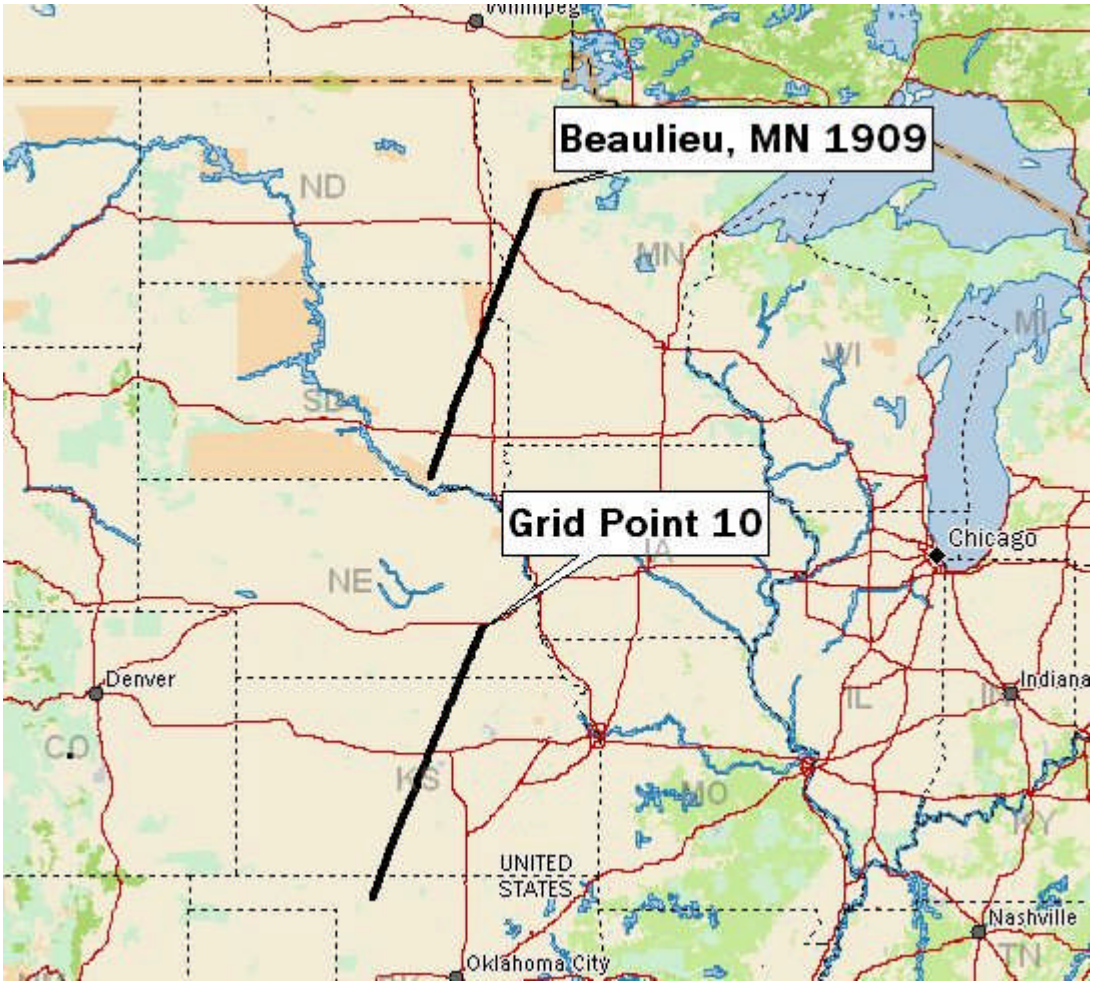
	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**10.5**	**10.7**	**10.8**	**11.5**	**11.7**	**11.8**	**12.1**	**12.8**	**13.2**
100 sq miles	**10.3**	**10.5**	**10.7**	**11.3**	**11.5**	**11.7**	**11.8**	**12.5**	**13.0**
200 sq miles	**10.1**	**10.4**	**10.5**	**11.1**	**11.3**	**11.5**	**11.6**	**12.1**	**12.5**
500 sq miles	**9.7**	**10.1**	**10.2**	**10.6**	**11.0**	**11.2**	**11.2**	**11.5**	**11.6**
1000 sq miles	**9.2**	**9.6**	**9.7**	**10.0**	**10.4**	**10.6**	**10.6**	**10.8**	**10.9**
5000 sq miles	**4.8**	**5.9**	**6.0**	**6.1**	**7.1**	**7.3**	**7.5**	**8.5**	**8.9**
10000 sq miles	**2.2**	**3.3**	**3.5**	**4.3**	**5.5**	**5.6**	**6.0**	**7.4**	**7.8**
20000 sq miles	**1.5**	**2.1**	**2.4**	**2.7**	**3.7**	**4.0**	**4.7**	**6.1**	**6.5**

Adjusted Storm Depth-Area-Duration

	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**12.9**	**13.1**	**13.3**	**14.1**	**14.4**	**14.5**	**14.8**	**15.7**	**16.2**
100 sq miles	**12.6**	**12.9**	**13.1**	**13.9**	**14.1**	**14.4**	**14.5**	**15.3**	**16.0**
200 sq miles	**12.4**	**12.8**	**12.9**	**13.6**	**13.9**	**14.1**	**14.2**	**14.8**	**15.3**
500 sq miles	**11.9**	**12.4**	**12.5**	**13.0**	**13.5**	**13.7**	**13.7**	**14.1**	**14.2**
1000 sq miles	**11.3**	**11.8**	**11.9**	**12.3**	**12.8**	**13.0**	**13.0**	**13.3**	**13.4**
5000 sq miles	**5.9**	**7.2**	**7.4**	**7.5**	**8.7**	**9.0**	**9.2**	**10.4**	**10.9**
10000 sq miles	**2.7**	**4.0**	**4.3**	**5.3**	**6.7**	**6.9**	**7.4**	**9.1**	**9.6**
20000 sq miles	**1.8**	**2.6**	**2.9**	**3.3**	**4.5**	**4.9**	**5.8**	**7.5**	**8.0**

Storm or Storm Center Name	**Beaulieu, MN**	
Storm Date(s)	18-Jul-1909	
Storm Type	MCC	
Storm Location	47.35 N	95.80 W
Storm Center Elevation	1,300	
Precipitation Total & Duration	13.20 Inches 72-hours USACE UMV 1-11	
Storm Representative Dewpoint	78.0 F	6hr average
Storm Representative Dewpoint Location	43.32 N	98.08 W
Maximum Dewpoint	83.0 F	
Moisture Inflow Vector	SSW @ 275	
In-place Maximization Factor	1.25	
Temporal Transposition (Date)	15-Jul	
Transposition Dewpoint Location	36.72 N	99.28 W
Transposition Maximum Dewpoint	82.5 F	
Basin Elevation	1,300	
Transposition to Basin Adjustment Factor	0.98	
Higher of Basin Elevation - Inflow Barrier Height	1,300	
Elevation Adjustment Factor	1.00	
Total Adjustment Factor	1.23	

Beaulieu, MN July 18, 1909 Inflow



DEPARTMENT OF THE ARMY — CORPS OF ENGINEERS

STORM STUDIES – PERTINENT DATA SHEET (REV.)

LOCATION MAP

Storm of 18-23 July 1909
Assignment UMV 1-11 (a)
Location Northern Minn. & Wis.
Study Prepared by:
Upper Mississippi Valley Division
St. Paul District Office
Part I Reviewed by H. M. Sec. of Weather Bureau, 6/7/39
Part II Approved by Office, Chief of Engineers for Distribution of Factual Data, 5/24/41
Remarks: Rainfall data only for Beaulieu, Minn. center Dewpt. 71° - Ref. Pt. 800 SSW Grid A-15

DATA AND COMPUTATIONS COMPILED

PART I

Preliminary isohyetal map, in 1 sheet, scale 1 : 1,000,000

Precipitation data and mass curves: (Number of Sheets)

Form 5001-C (Hourly precip. data)	4
Form 5001-B (24-hour " ")	-
Form 5001-D (" " " ")	8
Misc. precip. records, meteorological data, etc.	1
Form 5002 (Mass rainfall curves)	24

PART II

Final isohyetal maps, in 1 sheet, scale 1 : 1,000,000

Data and computation sheets:

Form S-10 (Data from mass rainfall curves)	4
Form S-11 (Depth-area data from isohyetal map)	2
Form S-12 (Maximum depth-duration data)	8
Maximum duration-depth-area curves	2
Data relating to periods of maximum rainfall	2

MAXIMUM AVERAGE DEPTH OF RAINFALL IN INCHES

Area in Sq. Mi.	Duration of Rainfall in Hours										
	6	12	18	24	30	36	48	60	72	96	108
10	10.5	10.7	10.8	11.5	11.7	11.8	11.8	12.0	12.1	12.1	12.1
100	10.3	10.5	10.7	11.3	11.5	11.7	11.7	12.0	12.0	12.0	12.0
200	10.1	10.4	10.5	11.1	11.3	11.5	11.5	11.8	11.8	11.8	11.8
500	9.7	10.1	10.2	10.6	10.9	11.2	11.2	11.4	11.5	11.5	11.5
1,000	9.2	9.6	9.7	10.0	10.4	10.6	10.6	10.8	10.9	10.9	10.9
2,000	7.9	8.5	8.6	8.7	9.3	9.4	9.5	9.8	9.9	9.9	9.9
5,000	4.8	5.9	6.0	6.1	6.7	7.0	7.2	7.9	8.0	8.1	8.1

Form S-2

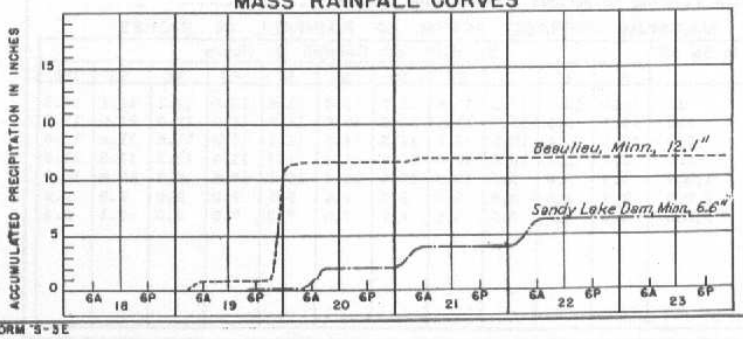
DEPARTMENT OF THE ARMY — CORPS OF ENGINEERS

STORM STUDIES – ISOHYETAL MAP

Storm of July 18-23, 1909 Assignment UMV 1-11 (a)

Study Prepared by: St. Paul Minn. District
Upper Mississippi Valley Division

MASS RAINFALL CURVES



FORM 3-3E

Bonaparte, IA June 10, 1905
Storm Type: MCC

Storm Name:	**Bonaparte, IA**
Storm Date:	**09-Jun-1905**
AWA Analysis Date:	**12/2/2008**

Storm Adjustment for Nebraska Grid Point 10

Temporal Transposition Date **30-Jun**

	Lat	Long
Storm center location	**40.70 N**	**91.80 W**
Storm Rep dew point location	**38.52 N**	**91.81 W**
Transposition dewpoint location	**39.03 N**	**96.43 W**
Basin location	**41.25 N**	**96.66 W**

Moisture Inflow Direction:	**S @ 150**	miles
Basin Elevation	**1,300**	feet
Storm Elevation	**1,500**	feet
Storm Duration	**6hr**	feet

The storm representative dew point is	**77.0 F**	with total precipitable water above sea level of			**3.14**	inches.
The in-place maximum dew point is	**81.5 F**	with total precipitable water above sea level of			**3.84**	inches.
The transpositioned maximum dew point is	**82.5 F**	with total precipitable water above sea level of			**4.00**	inches.
The in-place storm elevation is	**1,500**	which subtracts	**0.39**	inches of precipitable water at	**77.0 F**	
The in-place storm elevation is	**1,500**	which subtracts	**0.445**	inches of precipitable water at	**81.5 F**	
The transposition basin elevation at	**1,300**	which subtracts	**0.405**	inches of precipitable water at	**82.5 F**	
The inflow barrier/basin elevation height is	**1,300**	which subtracts	**0.405**	inches of precipitable water at	**82.5 F**	

The in-place storm maximization factor is	**1.23**
The transposition/elevation to basin factor is	**1.06**
The barrier adjustment factor is	**1.00**
The total adjustment factor is	**1.31**

Notes: DAD values taken from USACE UMV 2-5

Observed Storm Depth-Area-Duration

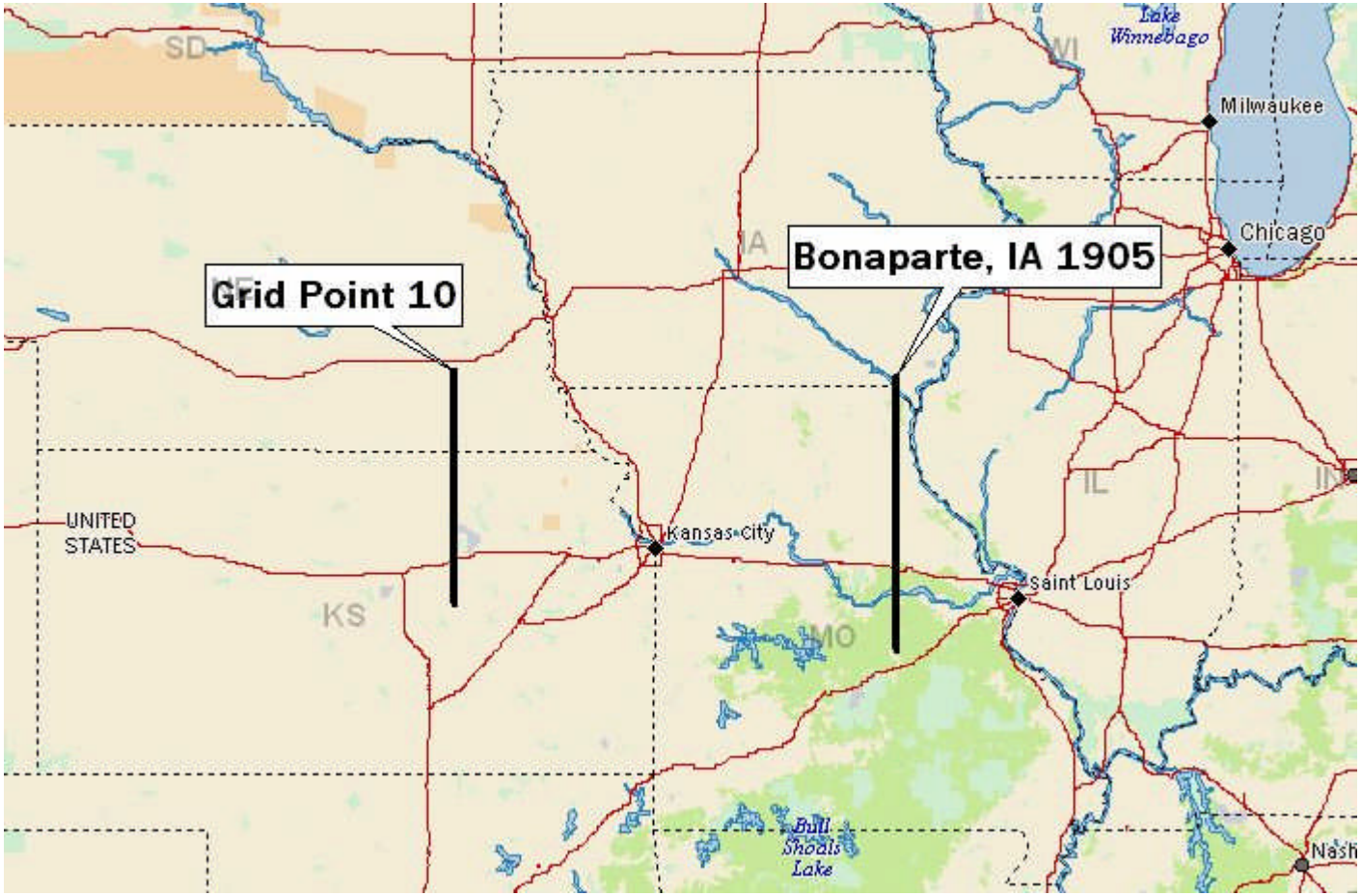
	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**10.0**	**12.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
100 sq miles	**9.2**	**11.5**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
200 sq miles	**8.9**	**11.3**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
500 sq miles	**8.5**	**10.7**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
1000 sq miles	**8.0**	**10.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
5000 sq miles	**5.8**	**7.3**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
10000 sq miles	**4.4**	**5.6**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
20000 sq miles	**3.0**	**3.9**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Adjusted Storm Depth-Area-Duration

	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**13.1**	**15.7**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
100 sq miles	**12.0**	**15.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
200 sq miles	**11.6**	**14.8**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
500 sq miles	**11.1**	**14.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
1000 sq miles	**10.5**	**13.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
5000 sq miles	**7.6**	**9.5**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
10000 sq miles	**5.8**	**7.3**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
20000 sq miles	**3.9**	**5.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

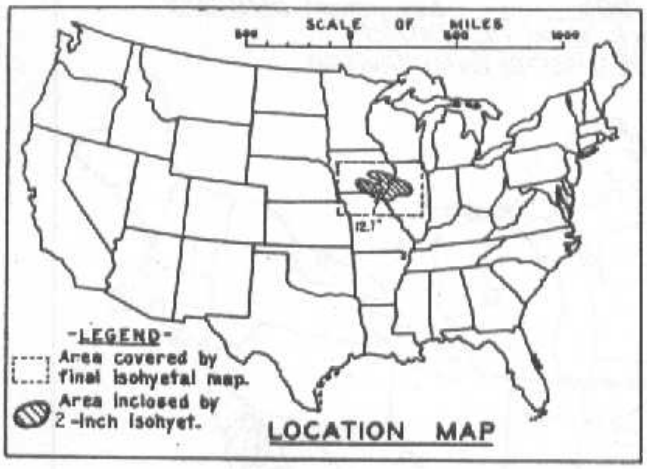
Storm or Storm Center Name	**Bonaparte, IA**
Storm Date(s)	9-Jun-1905
Storm Type	MCC
Storm Location	40.70 N 91.80 W
Storm Center Elevation	1,500
Precipitation Total & Duration	12.10 Inches 12-hours USACE UMV 2-5
Storm Representative Dewpoint	77.0 F 6hr average
Storm Representative Dewpoint Location	38.52 N 91.81 W
Maximum Dewpoint	81.5 F
Moisture Inflow Vector	S @ 150 Miles
In-place Maximization Factor	1.23
Temporal Transposition (Date)	30-Jun
Transposition Dewpoint Location	39.03 N 96.43 W
Transposition Maximum Dewpoint	82.5 F
Basin Elevation	1,300
Transposition to Basin Adjustment Factor	1.06
Higher of Basin Elevation - Inflow Barrier Height	1,300
Elevation Adjustment Factor	1.00
Total Adjustment Factor	1.31

Bonaparte, IA June 10, 1905 Inflow



WAR DEPARTMENT — CORPS OF ENGINEERS, U. S. ARMY

STORM STUDIES – PERTINENT DATA SHEET



LOCATION MAP

Storm of June 9 – 10, 1905
Assignment U M V 2 – 5
Location S.E. Ia. and W.Cent.Ill
Study Prepared by:
Upper Mississippi Valley Division

Rock Island District Office
Part I Reviewed by H. M. Sec. of Weather Bureau, 6/20/40
Part II Approved by Office, Chief of Engineers for Distribution of Factual Data, 6/22/44
Remarks: Centers at:
Bonapart (Near), Ia., and Le Harpe, Ill.

DATA AND COMPUTATIONS COMPILED

PART I

Preliminary isohyetal map, in 1 sheet, scale 1 : 2,500,000

Precipitation data and mass curves: (Number of Sheets)

Form 5001-C (Hourly precip. data)	8
Form 5001-B (24-hour " ")	-
Form 5001-D (" " " ")	6
Misc. precip. records, meteorological data, etc.	4
Form 5002 (Mass rainfall curves)	19

PART II

Final isohyetal maps, in 1 sheet, scale 1 : 1,000,000

Data and computation sheets:

Form S-10 (Data from mass rainfall curves)	2
Form S-11 (Depth-area data from isohyetal map)	1
Form S-12 (Maximum depth-duration data)	6
Maximum duration-depth-area curves	1
Data relating to periods of maximum rainfall	2

MAXIMUM AVERAGE DEPTH OF RAINFALL IN INCHES

Area in Sq. Mi.	Duration of Rainfall in Hours										
	1	2	3	4	5	6	7	8	10	12	
Max. Station	2.0	4.0	6.0	8.0	9.9	10.2	10.8	11.4	11.9	12.1	
10	2.0	4.0	5.9	7.9	9.7	10.0	10.5	11.2	11.8	12.0	
100	1.9	3.7	5.6	7.2	8.7	9.2	9.8	10.5	11.3	11.5	
200	1.8	3.6	5.5	7.0	8.4	8.9	9.5	10.2	11.1	11.3	
500	1.8	3.5	5.2	6.6	7.8	8.5	9.1	9.7	10.5	10.7	
1,000	1.7	3.4	4.9	6.2	7.4	8.0	8.6	9.0	9.8	10.0	
2,000	1.6	3.1	4.5	5.6	6.7	7.2	7.8	8.1	8.8	9.1	
5,000	1.3	2.5	3.5	4.5	5.2	5.8	6.2	6.5	7.0	7.3	
10,000	1.0	1.9	2.7	3.4	3.9	4.4	4.8	5.0	5.4	5.6	
20,000	0.7	1.3	1.7	2.1	2.5	3.0	3.1	3.3	3.7	3.9	

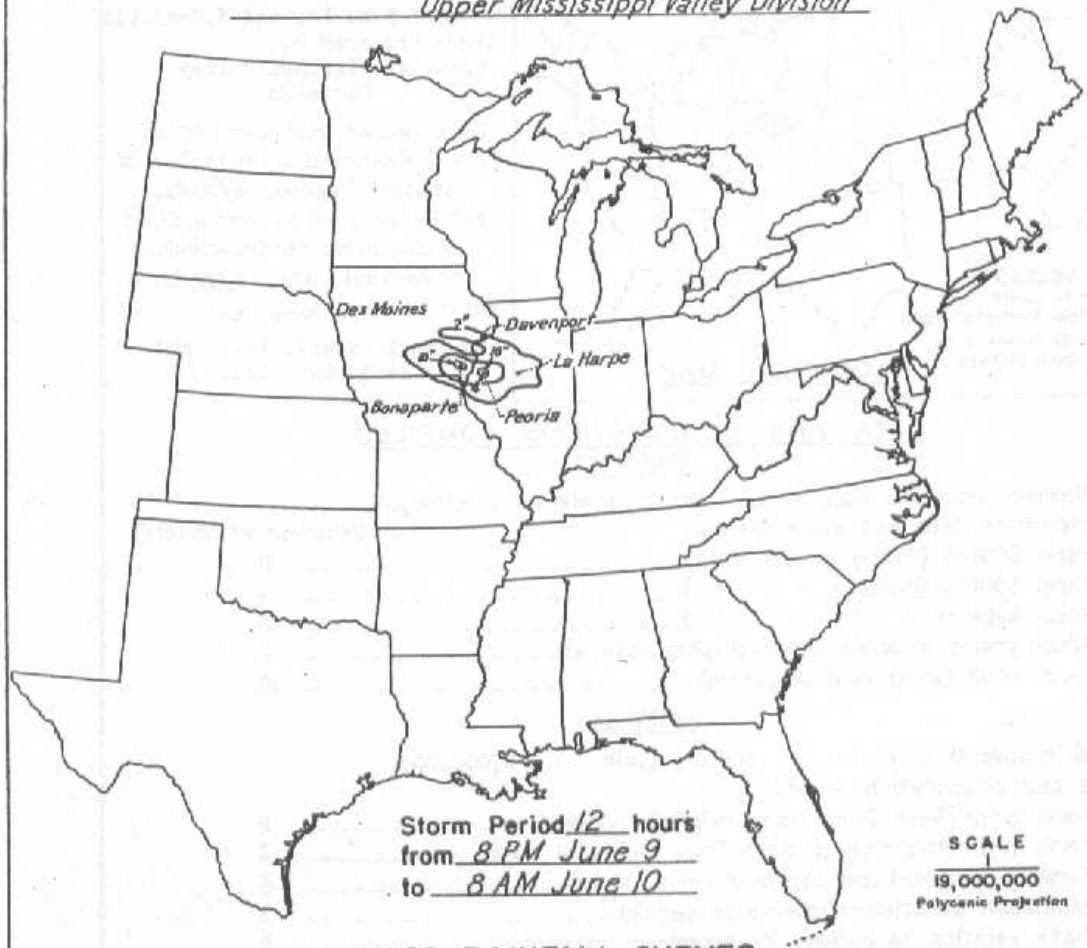
Form S-2

WAR DEPARTMENT — CORPS OF ENGINEERS, U. S. ARMY

STORM STUDIES – ISOHYETAL MAP

Storm of June 9-10, 1905 Assignment UMV 2-5

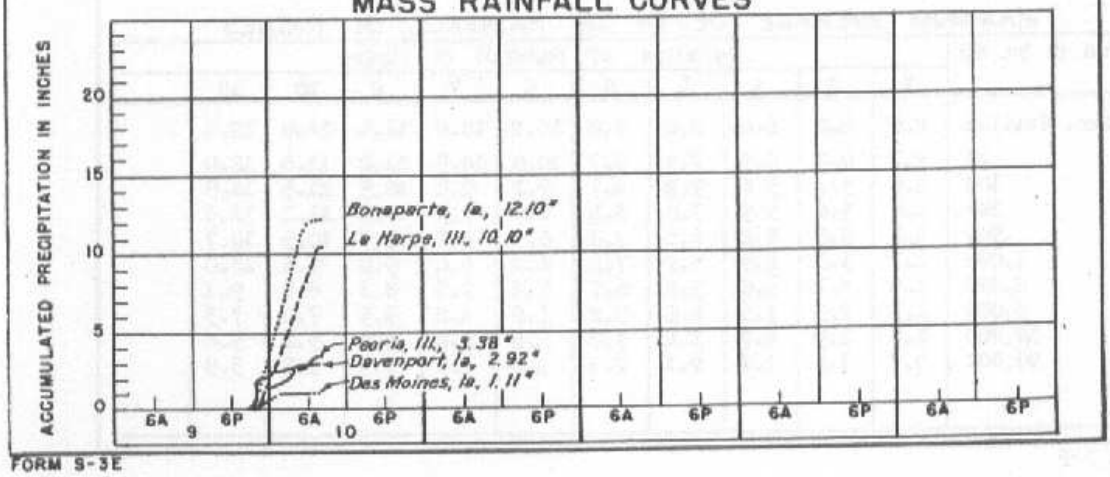
Study Prepared by: Rock Island, Ill. District
Upper Mississippi Valley Division



Storm Period 12 hours
from 8 PM June 9
to 8 AM June 10

SCALE
1
19,000,000
Polyconic Projection

MASS RAINFALL CURVES



FORM S-3E

Boyden, IA September 17, 1926
Storm Type: MCC

Storm Name:	**Boyden, IA**
Storm Date:	**17-Sep-1926**
AWA Analysis Date:	**12/2/2008**

Storm Adjustment for Nebraska Grid Point 10

Temporal Transposition Date **3-Sep**

	Lat	Long
Storm center location	**43.19 N**	**96.01 W**
Storm Rep dew point location	**40.87 N**	**94.74 W**
Transposition dewpoint location	**38.43 N**	**95.73 W**
Basin location	**41.25 N**	**96.66 W**

Moisture Inflow Direction:	**SSE @ 175**	miles
Basin Elevation	**1,300**	feet
Storm Elevation	**1,400**	feet
Storm Duration	**12hr**	feet

The storm representative dew point is	**77.0 F**	with total precipitable water above sea level of				**3.14**	inches.
The in-place maximum dew point is	**78.0 F**	with total precipitable water above sea level of				**3.29**	inches.
The transpositioned maximum dew point is	**78.0 F**	with total precipitable water above sea level of				**3.29**	inches.
The in-place storm elevation is	**1,400**	which subtracts	**0.37**	inches of precipitable water at		**77.0 F**	
The in-place storm elevation is	**1,400**	which subtracts	**0.38**	inches of precipitable water at		**78.0 F**	
The transposition basin elevation at	**1,300**	which subtracts	**0.36**	inches of precipitable water at		**78.0 F**	
The inflow barrier/basin elevation height is	**1,300**	which subtracts	**0.36**	inches of precipitable water at		**78.0 F**	

The in-place storm maximization factor is	**1.05**
The transposition/elevation to basin factor is	**1.01**
The barrier adjustment factor is	**1.00**
The total adjustment factor is	**1.06**

Notes: DAD values taken from USACE Storm Studies MR 4-24

Observed Storm Depth-Area-Duration

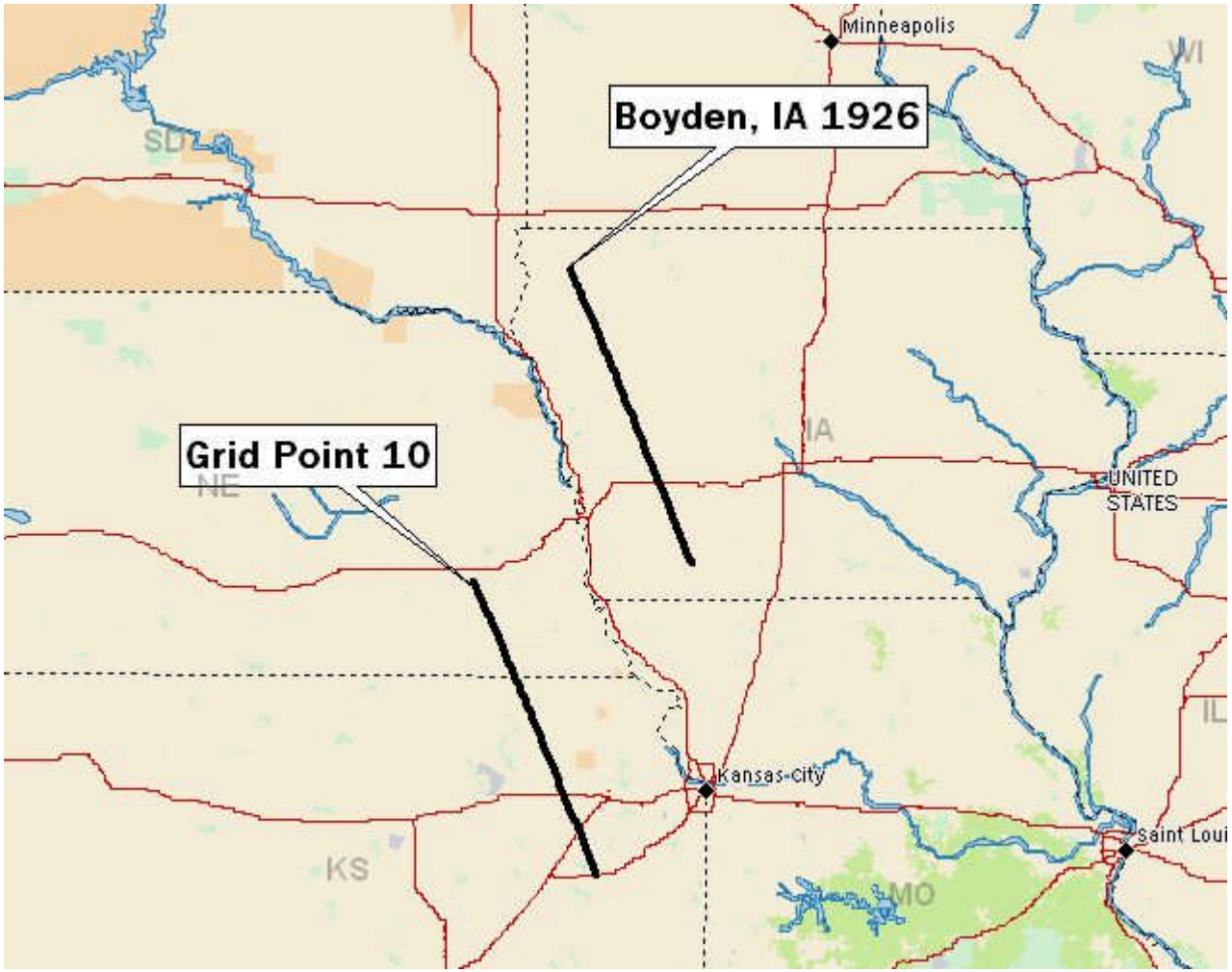
	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**15.1**	**20.7**	**21.7**	**21.7**	**21.7**	**21.7**	**21.7**	**0.0**	**0.0**
100 sq miles	**12.8**	**17.1**	**17.8**	**17.8**	**17.8**	**17.8**	**17.8**	**0.0**	**0.0**
200 sq miles	**11.7**	**15.8**	**16.6**	**16.6**	**16.6**	**16.6**	**16.6**	**0.0**	**0.0**
500 sq miles	**9.4**	**12.6**	**13.3**	**13.3**	**13.3**	**13.3**	**13.3**	**0.0**	**0.0**
1000 sq miles	**7.5**	**10.1**	**10.4**	**10.6**	**10.6**	**10.6**	**10.6**	**0.0**	**0.0**
5000 sq miles	**4.1**	**6.3**	**6.4**	**6.6**	**6.6**	**6.6**	**6.6**	**0.0**	**0.0**
10000 sq miles	**3.0**	**5.2**	**5.4**	**5.5**	**5.6**	**5.6**	**5.6**	**0.0**	**0.0**
20000 sq miles	**2.1**	**4.1**	**4.3**	**4.4**	**4.6**	**4.8**	**4.9**	**0.0**	**0.0**

Adjusted Storm Depth-Area-Duration

	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**16.0**	**21.9**	**23.0**	**23.0**	**23.0**	**23.0**	**23.0**	**0.0**	**0.0**
100 sq miles	**13.5**	**18.1**	**18.8**	**18.8**	**18.8**	**18.8**	**18.8**	**0.0**	**0.0**
200 sq miles	**12.4**	**16.7**	**17.6**	**17.6**	**17.6**	**17.6**	**17.6**	**0.0**	**0.0**
500 sq miles	**9.9**	**13.3**	**14.1**	**14.1**	**14.1**	**14.1**	**14.1**	**0.0**	**0.0**
1000 sq miles	**7.9**	**10.7**	**11.0**	**11.2**	**11.2**	**11.2**	**11.2**	**0.0**	**0.0**
5000 sq miles	**4.3**	**6.7**	**6.8**	**7.0**	**7.0**	**7.0**	**7.0**	**0.0**	**0.0**
10000 sq miles	**3.2**	**5.5**	**5.7**	**5.8**	**5.9**	**5.9**	**5.9**	**0.0**	**0.0**
20000 sq miles	**2.2**	**4.3**	**4.5**	**4.7**	**4.9**	**5.1**	**5.2**	**0.0**	**0.0**

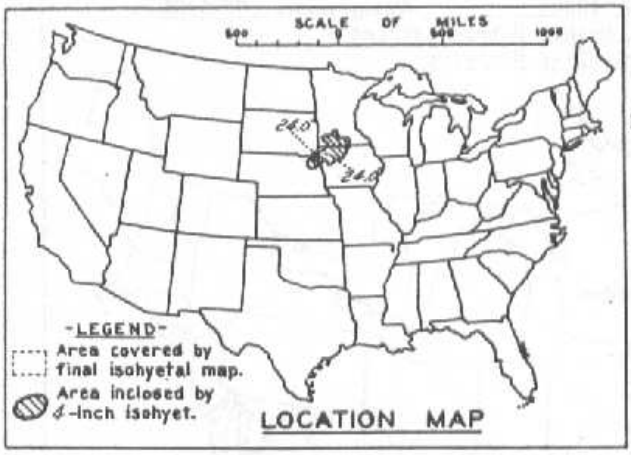
Storm or Storm Center Name	**Boyden, IA**	
Storm Date(s)	17-Sep-1926	
Storm Type	MCC	
Storm Location	43.19 N	96.01 W
Storm Center Elevation	1,400	
Precipitation Total & Duration	24.00 Inches 18-hours USACE Storm Studies MR 4-24	
Storm Representative Dewpoint	77.0 F	12hr average
Storm Representative Dewpoint Location	40.87 N	94.74 W
Maximum Dewpoint	78.0 F	
Moisture Inflow Vector	SSE @ 175	
In-place Maximization Factor	1.05	
Temporal Transposition (Date)	3-Sep	
Transposition Dewpoint Location	38.43 N	95.73 W
Transposition Maximum Dewpoint	78.0 F	
Basin Elevation	1,300	
Transposition to Basin Adjustment Factor	1.01	
Higher of Basin Elevation - Inflow Barrier Height	1,300	
Elevation Adjustment Factor	1.00	
Total Adjustment Factor	1.06	

Boyden, IA September 17, 1926 Inflow



DEPARTMENT OF THE ARMY — CORPS OF ENGINEERS

STORM STUDIES - PERTINENT DATA SHEET



LOCATION MAP

Storm of 17-19 September 1926
Assignment MR 4-24
Location Ia, Minn, Nebr. S.D. & Wisc
Study Prepared by:
Missouri River Division
Omaha District Office

Part I Reviewed by H. M. Sec. of Weather Bureau, 8/5/47
Part II Approved by Office, Chief of Engineers for Distribution of Factual Data, 12/23/47
Remarks: Centers near Boyden & Maurice, Ia. Dewpt. 70° - Ref. Pt. 175 SSE Grid C-15

DATA AND COMPUTATIONS COMPILED

PART I

Preliminary isohyetal map, in 2 sheets, scale 1:500,000

Precipitation data and mass curves:	(Number of Sheets)
Form 5001-C (Hourly precip. data)	8
Form 5001-B (24-hour " ")	-
Form 5001-D (" " " ")	11
Miscl. precip. records, meteorological data, etc.	29
Form 5002 (Mass rainfall curves)	27

PART II

Final isohyetal maps, in 1 sheet, scale 1:1,000,000
Data and computation sheets:

Form S-10 (Data from mass rainfall curves)	3
Form S-11 (Depth-area data from isohyetal map)	2
Form S-12 (Maximum depth-duration data)	17
Maximum duration-depth-area curves	1
Data relating to periods of maximum rainfall	7

MAXIMUM AVERAGE DEPTH OF RAINFALL IN INCHES

Area in Sq. Mi.	Duration of Rainfall in Hours										
	6	12	18	24	30	36	48	54			
Max. Station	18.4	23.8	24.0	24.0	24.0	24.0	24.0	24.0			
10	15.1	20.7	21.7	21.7	21.7	21.7	21.7	21.7			
100	12.8	17.1	17.8	17.8	17.8	17.8	17.8	17.8			
200	11.7	15.8	16.5	16.6	16.6	16.6	16.6	16.6			
500	9.4	12.6	13.3	13.3	13.3	13.3	13.3	13.3			
1,000	7.5	10.1	10.4	10.6	10.6	10.6	10.6	10.6			
2,000	5.9	8.0	8.2	8.6	8.6	8.6	8.6	8.6			
5,000	4.1	6.3	6.4	6.6	6.6	6.6	6.6	6.6			
10,000	3.0	5.2	5.4	5.5	5.6	5.6	5.6	5.6			
20,000	2.1	4.1	4.3	4.4	4.6	4.8	4.9	4.9			
50,000	1.4	2.7	2.9	3.0	3.2	3.6	3.8	3.8			
63,000	1.2	2.4	2.6	2.7	2.9	3.3	3.5	3.5			

Form S-2

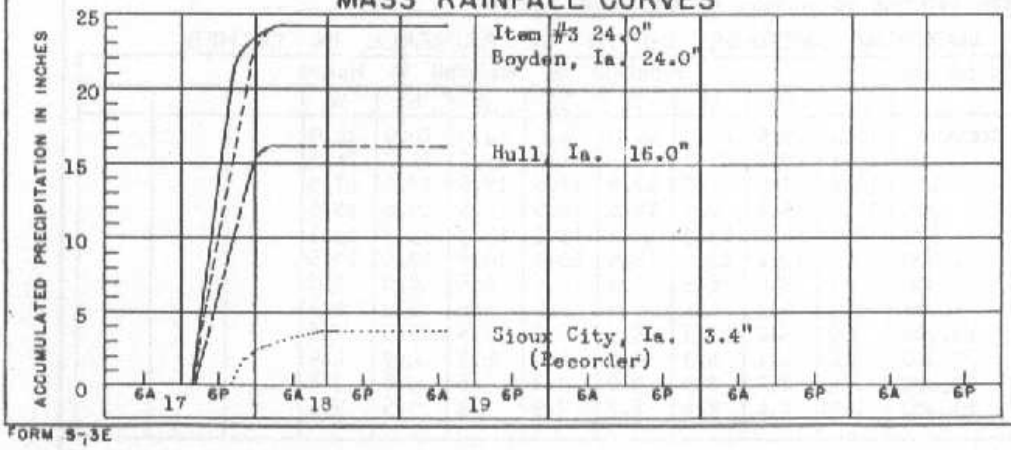
DEPARTMENT OF THE ARMY — CORPS OF ENGINEERS

STORM STUDIES – ISOHYETAL MAP

Storm of 17-19 September 1926 Assignment MR 4-24

Study Prepared by: Omaha, Nebr. District
Missouri River Division

MASS RAINFALL CURVES



FORM 5-3E

Cheyenne, OK April 3, 1934
Storm Type: MCC

Storm Name:	**Cheyenne, OK**
Storm Date:	**03-Apr-1934**
AWA Analysis Date:	**12/2/2008**

Storm Adjustment for Nebraska Grid Point 5

Temporal Transposition Date **15-Apr**

	Lat	Long
Storm center location	**35.61 N**	**99.67 W**
Storm Rep dew point location	**33.04 N**	**96.62 W**
Transposition dewpoint location	**38.18 N**	**93.95 W**
Basin location	**41.25 N**	**96.66 W**

Moisture Inflow Direction:	**SE @ 250**	miles
Basin Elevation	**1,300**	feet
Storm Elevation	**1,990**	feet
Storm Duration	**12hr**	feet

The storm representative dew point is	**72.0 F**	with total precipitable water above sea level of			**2.47**	inches.
The in-place maximum dew point is	**73.0 F**	with total precipitable water above sea level of			**2.60**	inches.
The transpositioned maximum dew point is	**69.5 F**	with total precipitable water above sea level of			**2.20**	inches.
The in-place storm elevation is	**1,990**	which subtracts	**0.44**	inches of precipitable water at	**72.0 F**	
The in-place storm elevation is	**1,990**	which subtracts	**0.45**	inches of precipitable water at	**73.0 F**	
The transposition basin elevation at	**1,300**	which subtracts	**0.27**	inches of precipitable water at	**69.5 F**	
The inflow barrier/basin elevation height is	**1,300**	which subtracts	**0.27**	inches of precipitable water at	**69.5 F**	

The in-place storm maximization factor is	**1.06**
The transposition/elevation to basin factor is	**0.90**
The barrier adjustment factor is	**1.00**
The total adjustment factor is	**0.95**

Notes: DAD values taken from USACE Storm Studies MR 6-15

Observed Storm Depth-Area-Duration

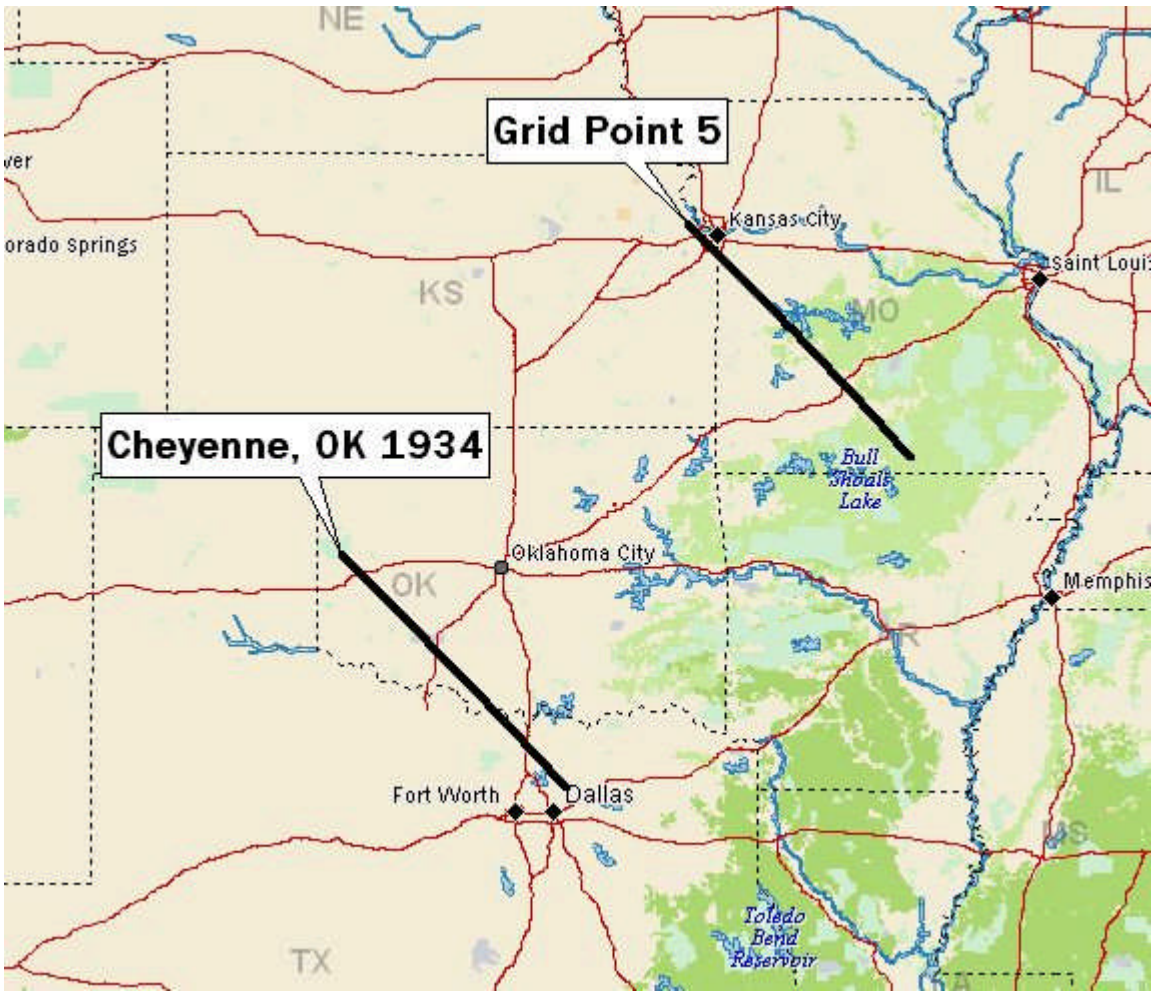
	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**17.3**	**20.8**	**21.3**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
100 sq miles	**14.4**	**17.1**	**17.7**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
200 sq miles	**13.3**	**15.7**	**16.4**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
500 sq miles	**11.5**	**13.5**	**14.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
1000 sq miles	**9.1**	**10.7**	**11.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
5000 sq miles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
10000 sq miles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
20000 sq miles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Adjusted Storm Depth-Area-Duration

	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**16.4**	**19.8**	**20.3**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
100 sq miles	**13.7**	**16.3**	**16.8**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
200 sq miles	**12.6**	**14.9**	**15.6**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
500 sq miles	**10.9**	**12.8**	**13.3**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
1000 sq miles	**8.7**	**10.2**	**10.6**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
5000 sq miles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
10000 sq miles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
20000 sq miles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

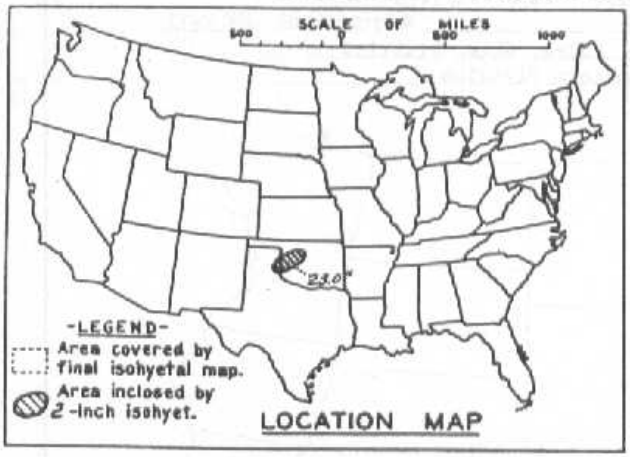
Storm or Storm Center Name	**Cheyenne, OK**	
Storm Date(s)	3-Apr-1934	
Storm Type	MCC	
Storm Location	35.61 N	99.67 W
Storm Center Elevation	1,990	
Precipitation Total & Duration	23.00 Inches 12-hours USACE Storm Studies SW 2-11	
Storm Representative Dewpoint	72.0 F	12hr average added 7°F to Td as accepted by EPRI Michigan Wisconsin study
Storm Representative Dewpoint Location	33.04 N	96.62 W
Maximum Dewpoint	73.0 F	
Moisture Inflow Vector	SE @ 250	
In-place Maximization Factor	1.06	
Temporal Transposition (Date)	15-Apr	
Transposition Dewpoint Location	38.18 N	93.95 W
Transposition Maximum Dewpoint	69.5 F	
Basin Elevation	1,300	
Transposition to Basin Adjustment Factor	0.90	
Higher of Basin Elevation - Inflow Barrier Height	1,300	
Elevation Adjustment Factor	1.00	
Total Adjustment Factor	0.95	

Cheyenne, OK April 3, 1934 Inflow



DEPARTMENT OF THE ARMY — CORPS OF ENGINEERS

STORM STUDIES - PERTINENT DATA SHEET



LOCATION MAP

Storm of 3-4 April 1934
Assignment SW 2-11
Location Oklahoma and Texas
Study Prepared by:
Southwestern Division
Tulsa District Office

Part I Reviewed by H. M. Sec. of Weather Bureau, 7/22/46
Part II Approved by Office, Chief of Engineers for Distribution of Factual Data, 8/19/47
Remarks: Center near Cheyenne, Oklahoma
Dewpt. 64°- Ref. Pt. 250 SE Grid G-17

DATA AND COMPUTATIONS COMPILED

PART I

Preliminary isohyetal map, in 1 sheet, scale 1:250,000

Precipitation data and mass curves: (Number of Sheets)

Form 5001-C (Hourly precip. data)	2
Form 5001-B (24-hour " ")	-
Form 5001-D (" " " ")	7
Miscl. precip. records, meteorological data, etc. (Supplemental Folder)	112
Form 5002 (Mass rainfall curves)	21

PART II

Final isohyetal maps, in 1 sheet, scale 1:250,000

Data and computation sheets:

Form S-10 (Data from mass rainfall curves)	3
Form S-11 (Depth-area data from isohyetal map)	2
Form S-12 (Maximum depth-duration data)	4
Maximum duration-depth-area curves	1
Data relating to periods of maximum rainfall	1

MAXIMUM AVERAGE DEPTH OF RAINFALL IN INCHES

Area in Sq. Mi.	Duration of Rainfall in Hours										
	6	12	18								
Max. Station	20.0	23.0	23.0								
10	17.3	20.8	21.3								
100	14.4	17.1	17.7								
200	13.3	15.7	16.4								
500	11.5	13.5	14.0								
1,000	9.1	10.7	11.1								
2,000	6.2	7.3	7.5								
2,200	5.8	6.9	7.1								

Form 5-2

DEPARTMENT OF THE ARMY — CORPS OF ENGINEERS

STORM STUDIES – ISOHYETAL MAP

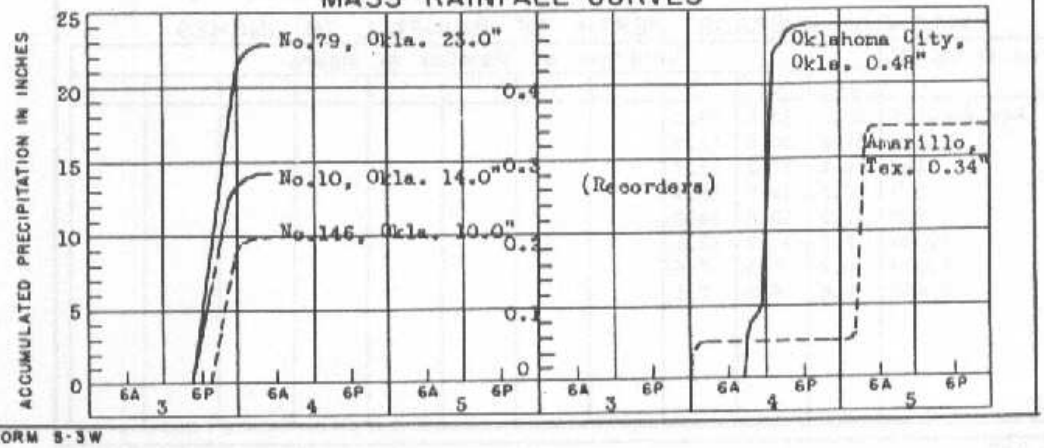
Storm of 3-4 April 1934 — Assignment SW 2-11

Study Prepared by: Tulsa, Okla. District
Southwestern Division

Storm Period 18 hours
from 12 N April 3
to 6 AM April 4

SCALE
1/9,000,000
Polyconic Projection

MASS RAINFALL CURVES



FORM S-3W

Cole Camp, MO August 12, 1946
Storm Type: Synoptic

Storm Name:	**Cole Camp, MO**
Storm Date:	**12-Aug-1946**
AWA Analysis Date:	**12/2/2008**

Storm Adjustment for Nebraska Grid Point 10

Temporal Transposition Date **28-Jul**

	Lat	Long
Storm center location	**38.46 N**	**93.20 W**
Storm Rep dew point location	**35.20 N**	**93.20 W**
Transposition dewpoint location	**37.49 N**	**97.0 W**
Basin location	**41.25 N**	**96.66 W**

Moisture Inflow Direction:	**S @ 225**	miles
Basin Elevation	**1,300**	feet
Storm Elevation	**1,000**	feet
Storm Duration	**24hr**	feet

The storm representative dew point is	**76.0 F**	with total precipitable water above sea level of			**2.99**	inches.
The in-place maximum dew point is	**79.0 F**	with total precipitable water above sea level of			**3.44**	inches.
The transpositioned maximum dew point is	**79.5 F**	with total precipitable water above sea level of			**3.52**	inches.
The in-place storm elevation is	**1,000**	which subtracts	**0.26**	inches of precipitable water at	**76.0 F**	
The in-place storm elevation is	**1,000**	which subtracts	**0.28**	inches of precipitable water at	**79.0 F**	
The transposition basin elevation at	**1,300**	which subtracts	**0.375**	inches of precipitable water at	**79.5 F**	
The inflow barrier/basin elevation height is	**1,300**	which subtracts	**0.375**	inches of precipitable water at	**79.5 F**	

The in-place storm maximization factor is	**1.16**
The transposition/elevation to basin factor is	**1.00**
The barrier adjustment factor is	**1.00**
The total adjustment factor is	**1.15**

Notes: DAD values taken from USACE MR 7-2A

Observed Storm Depth-Area-Duration

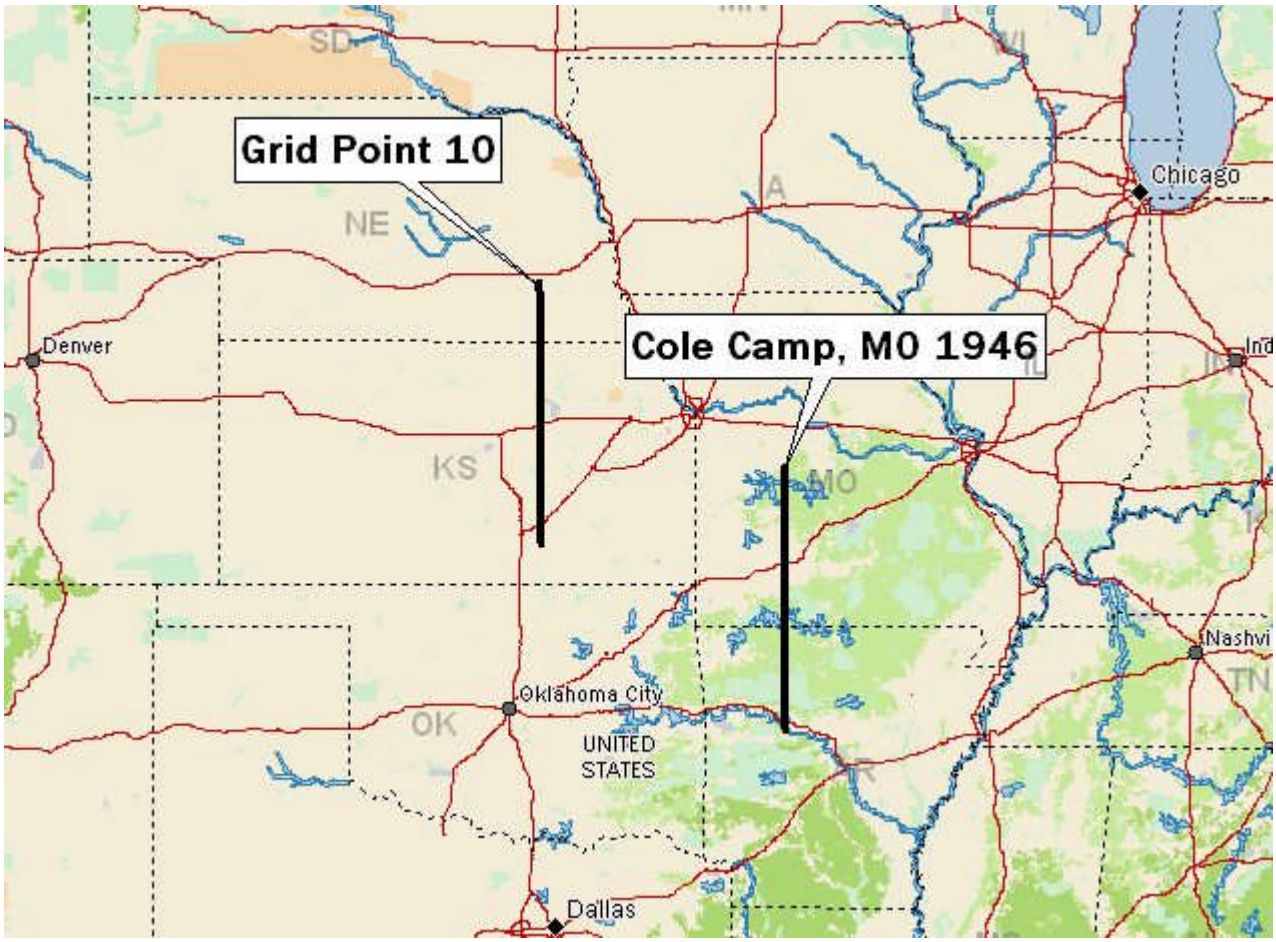
	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**10.6**	**11.0**	**11.1**	**15.0**	**17.4**	**18.5**	**19.0**	**19.4**	**19.4**
100 sq miles	**9.0**	**9.9**	**10.0**	**13.4**	**16.0**	**17.0**	**18.3**	**18.6**	**18.6**
200 sq miles	**8.3**	**8.2**	**9.4**	**12.4**	**15.0**	**16.1**	**17.4**	**17.7**	**17.7**
500 sq miles	**7.0**	**7.9**	**8.0**	**10.4**	**12.9**	**14.1**	**15.5**	**15.9**	**15.9**
1000 sq miles	**5.5**	**6.6**	**7.0**	**8.3**	**10.9**	**12.0**	**13.7**	**14.1**	**14.1**
5000 sq miles	**3.3**	**5.5**	**5.6**	**5.9**	**7.8**	**8.6**	**9.6**	**10.0**	**10.1**
10000 sq miles	**2.8**	**4.2**	**5.0**	**5.4**	**6.5**	**7.2**	**8.1**	**8.4**	**8.7**
20000 sq miles	**2.3**	**3.4**	**4.2**	**4.5**	**5.1**	**5.7**	**6.6**	**6.9**	**7.2**

Adjusted Storm Depth-Area-Duration

	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**12.2**	**12.7**	**12.8**	**17.3**	**20.0**	**21.3**	**21.9**	**22.3**	**22.3**
100 sq miles	**10.4**	**11.4**	**11.5**	**15.4**	**18.4**	**19.6**	**21.1**	**21.4**	**21.4**
200 sq miles	**9.6**	**9.4**	**10.8**	**14.3**	**17.3**	**18.5**	**20.0**	**20.4**	**20.4**
500 sq miles	**8.1**	**9.1**	**9.2**	**12.0**	**14.9**	**16.2**	**17.9**	**18.3**	**18.3**
1000 sq miles	**6.3**	**7.6**	**8.1**	**9.6**	**12.6**	**13.8**	**15.8**	**16.2**	**16.2**
5000 sq miles	**3.8**	**6.3**	**6.5**	**6.8**	**9.0**	**9.9**	**11.1**	**11.5**	**11.6**
10000 sq miles	**3.2**	**4.8**	**5.8**	**6.2**	**7.5**	**8.3**	**9.3**	**9.7**	**10.0**
20000 sq miles	**2.6**	**3.9**	**4.8**	**5.2**	**5.9**	**6.6**	**7.6**	**7.9**	**8.3**

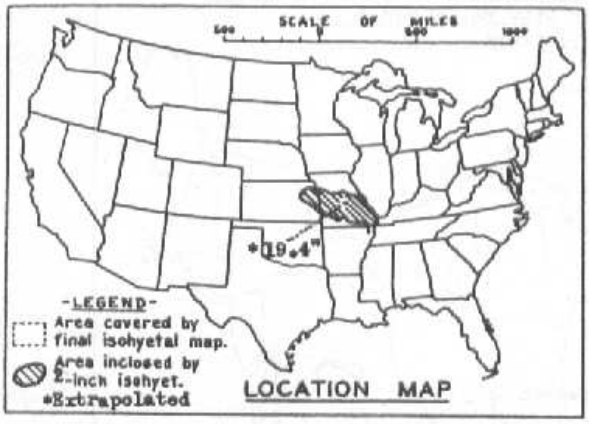
Storm or Storm Center Name	**Cole Camp, MO**
Storm Date(s)	12-Aug-1946
Storm Type	Synoptic
Storm Location	38.46 N 93.20 W
Storm Center Elevation	1,000
Precipitation Total & Duration	19.40 Inches 60-hours USACE MR 7-2A
Storm Representative Dewpoint	76.0 F 24hr average
Storm Representative Dewpoint Location	35.20 N 93.20 W
Maximum Dewpoint	79.0 F
Moisture Inflow Vector	S @ 225 Miles
In-place Maximization Factor	1.16
Temporal Transposition (Date)	28-Jul
Transposition Dewpoint Location	37.49 N 97.0 W
Transposition Maximum Dewpoint	79.5 F
Basin Elevation	1,300
Transposition to Basin Adjustment Factor	1.00
Higher of Basin Elevation - Inflow Barrier Height	1,300
Elevation Adjustment Factor	1.00
Total Adjustment Factor	1.15

Cole Camp, MO August 12, 1946 Inflow



DEPARTMENT OF THE ARMY — CORPS OF ENGINEERS

STORM STUDIES - PERTINENT DATA SHEET



Storm of 12-15 August 1946
Assignment MR 7-2A
Location Kansas & Missouri
Study Prepared by:
Missouri River Division
Kansas City District

Part I Reviewed by H. M. Sec. of Weather Bureau, 8/30/48
Part II Approved by Office, Chief of Engineers for Distribution of Factual Data, 3/20/50
Remarks: Center near Cole Camp, Mo.
Dewpt. 74° - Ref. Pt. 140'S Grid F-14

DATA AND COMPUTATIONS COMPILED

PART I

Preliminary isohyetal map, in 1 sheet, scale 1: 1,000,000

Precipitation data and mass curves:	(Number of Sheets)
Form 5001-C (Hourly precip. data)	64
Form 5001-B (24-hour " ")	-
Form 5001-D (" " " ")	18
Miscl. precip. records, meteorological data, etc.	30
Form 5002 (Mass rainfall curves)	51

PART II

Final isohyetal maps, in 1 sheet, scale 1: 1,000,000

Data and computation sheets:

Form S-10 (Data from mass rainfall curves)	6
Form S-11 (Depth-area data from isohyetal map)	2
Form S-12 (Maximum depth-duration data)	16
Maximum duration-depth-area curves	1
Data relating to periods of maximum rainfall	2

MAXIMUM AVERAGE DEPTH OF RAINFALL IN INCHES

Area in Sq. Mi.	Duration of Rainfall in Hours										
	6	12	18	24	30	36	48	60	72	78	
10	10.6	11.0	11.1	15.0	17.4	18.5	19.0	19.4	19.4	19.4	
100	9.0	9.9	10.0	13.4	16.0	17.0	18.3	18.6	18.6	18.6	
200	8.3	9.2	9.4	12.4	15.0	16.1	17.4	17.7	17.7	17.7	
500	7.0	7.9	8.0	10.4	12.9	14.1	15.5	15.9	15.9	15.9	
1,000	5.5	6.6	7.0	8.3	10.9	12.0	13.7	14.1	14.1	14.1	
2,000	4.2	5.5	6.3	6.8	9.4	10.4	11.8	12.3	12.3	12.3	
5,000	3.3	4.7	5.6	5.9	7.8	8.6	9.6	10.0	10.1	10.1	
10,000	2.8	4.2	5.0	5.4	6.5	7.2	8.1	8.4	8.7	8.7	
20,000	2.3	3.4	4.2	4.5	5.1	5.7	6.6	6.9	7.2	7.2	
45,000	1.4	2.3	2.7	2.9	3.3	3.9	4.5	4.8	5.0	5.0	

Form S-2

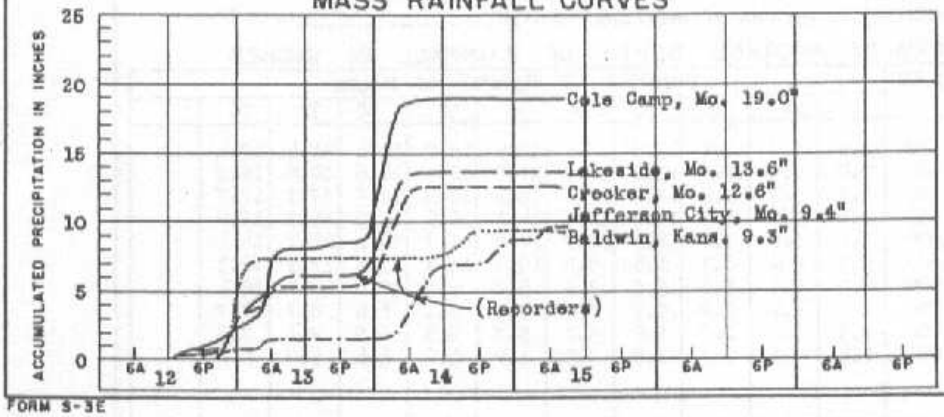
DEPARTMENT OF THE ARMY CORPS OF ENGINEERS

STORM STUDIES - ISOHYETAL MAP

Storm of 12-15 August 1946 Assignment MR 7-2A

Study Prepared by: Kansas City, Mo. District
Missouri River Division

MASS RAINFALL CURVES



FORM S-3E

Collinsville, IL August 12, 1946
Storm Type: Synoptic

Storm Name:	**Collinsville, IL**
Storm Date:	**12-Aug-1946**
AWA Analysis Date:	**12/2/2008**

Storm Adjustment for Grid Point 10

Temporal Transposition Date **28-Jul**

	Lat	Long
Storm center location	**38.67 N**	**89.98 W**
Storm Rep dew point location	**35.41 N**	**89.98 W**
Transposition dewpoint location	**37.49 N**	**96.20 W**
Basin location	**41.25 N**	**96.66 W**

Moisture Inflow Direction:	**S @ 225**	miles
Basin Elevation	**1,300**	feet
Storm Elevation	**600**	feet
Storm Duration	**24hr**	feet

The storm representative dew point is	**76.0 F**	with total precipitable water above sea level of			**2.99**	inches.
The in-place maximum dew point is	**79.0 F**	with total precipitable water above sea level of			**3.44**	inches.
The transpositioned maximum dew point is	**79.5 F**	with total precipitable water above sea level of			**3.52**	inches.
The in-place storm elevation is	**600**	which subtracts	**0.16**	inches of precipitable water at	**76.0 F**	
The in-place storm elevation is	**600**	which subtracts	**0.17**	inches of precipitable water at	**79.0 F**	
The transposition basin elevation at	**1,300**	which subtracts	**0.375**	inches of precipitable water at	**79.5 F**	
The inflow barrier/basin elevation height is	**1,300**	which subtracts	**0.375**	inches of precipitable water at	**79.5 F**	

The in-place storm maximization factor is	**1.16**
The transposition/elevation to basin factor is	**0.96**
The barrier adjustment factor is	**1.00**
The total adjustment factor is	**1.11**

DAD values taken from HMR 51 DAD Table Storm Index N. 80-USACE MR 7-2B

Observed Storm Depth-Area-Duration

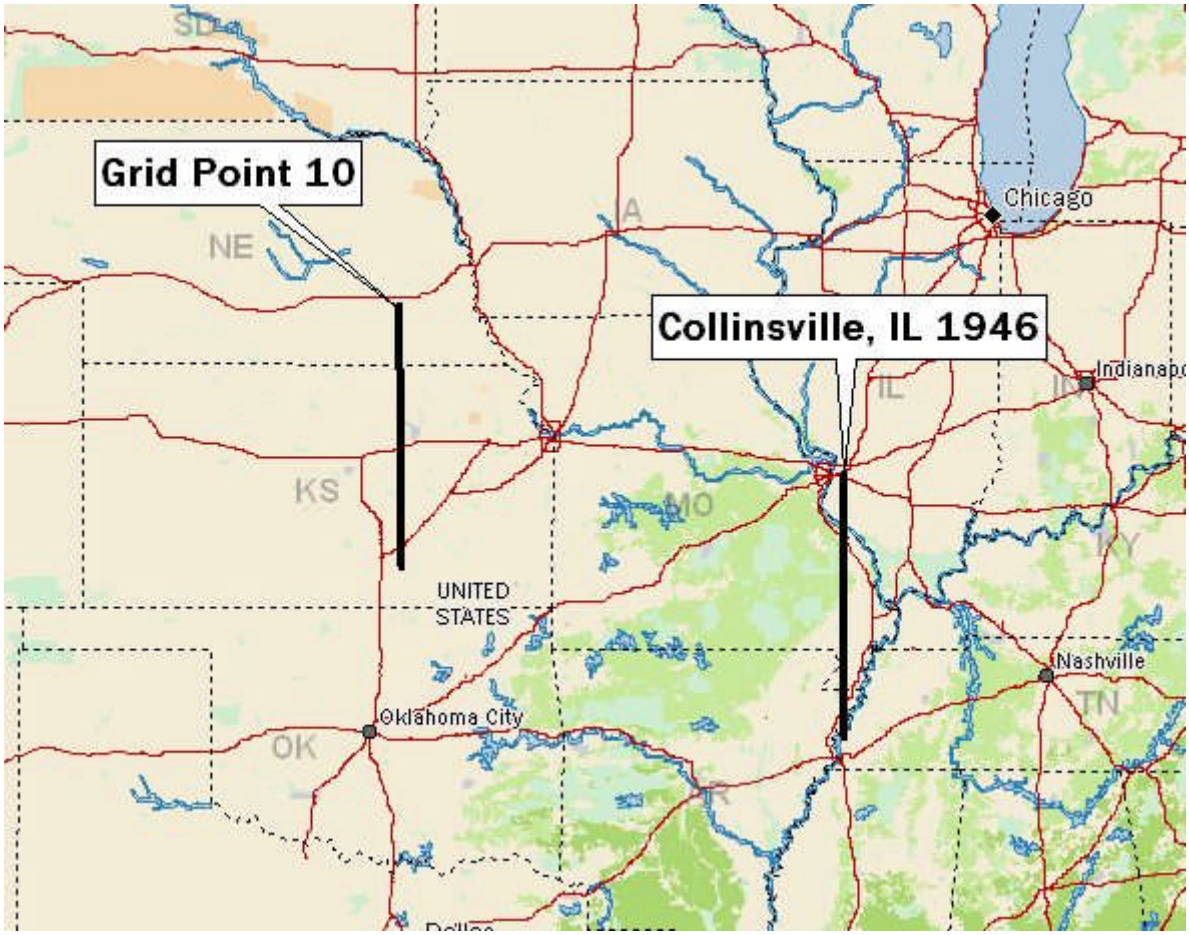
	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**6.0**	**9.8**	**12.1**	**12.1**	**13.7**	**17.5**	**17.6**	**18.3**	**18.3**
100 sq miles	**5.6**	**8.8**	**10.9**	**11.1**	**13.2**	**16.6**	**16.7**	**17.5**	**17.6**
200 sq miles	**5.4**	**8.5**	**10.5**	**10.6**	**13.0**	**16.2**	**16.3**	**17.2**	**17.3**
500 sq miles	**5.2**	**7.7**	**9.7**	**9.9**	**12.8**	**15.5**	**15.6**	**16.7**	**16.9**
1000 sq miles	**4.9**	**7.0**	**8.9**	**9.0**	**12.6**	**14.7**	**14.8**	**15.9**	**16.0**
5000 sq miles	**3.3**	**4.8**	**5.9**	**6.0**	**8.6**	**10.4**	**10.6**	**11.3**	**11.4**
10000 sq miles	**2.4**	**3.7**	**4.5**	**4.6**	**6.6**	**8.0**	**8.2**	**8.7**	**8.8**
20000 sq miles	**1.5**	**2.5**	**3.1**	**3.2**	**4.6**	**5.6**	**5.8**	**6.0**	**6.1**

Adjusted Storm Depth-Area-Duration

	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**6.7**	**10.9**	**13.4**	**13.4**	**15.2**	**19.4**	**19.6**	**20.3**	**20.3**
100 sq miles	**6.2**	**9.8**	**12.1**	**12.3**	**14.7**	**18.4**	**18.6**	**19.4**	**19.6**
200 sq miles	**6.0**	**9.4**	**11.7**	**11.8**	**14.4**	**18.0**	**18.1**	**19.1**	**19.2**
500 sq miles	**5.8**	**8.6**	**10.8**	**11.0**	**14.2**	**17.2**	**17.3**	**18.6**	**18.8**
1000 sq miles	**5.4**	**7.8**	**9.9**	**10.0**	**14.0**	**16.3**	**16.4**	**17.7**	**17.8**
5000 sq miles	**3.7**	**5.3**	**6.6**	**6.7**	**9.6**	**11.6**	**11.8**	**12.6**	**12.7**
10000 sq miles	**2.7**	**4.1**	**5.0**	**5.1**	**7.3**	**8.9**	**9.1**	**9.7**	**9.8**
20000 sq miles	**1.7**	**2.8**	**3.4**	**3.6**	**5.1**	**6.2**	**6.4**	**6.7**	**6.8**

Storm or Storm Center Name	**Collinsville, IL**
Storm Date(s)	12-Aug-1946
Storm Type	Synoptic
Storm Location	38.67 N 89.98 W
Storm Center Elevation	600
Precipitation Total & Duration	18.30 Inches 72-hours USACE MR 7-2B, HMR 51 DAD Table N. 80
Storm Representative Dewpoint	76.0 F 24hr average
Storm Representative Dewpoint Location	35.41 N 89.98 W
Maximum Dewpoint	79.0 F
Moisture Inflow Vector	S @ 225 Miles
In-place Maximization Factor	1.16
Temporal Transposition (Date)	28-Jul
Transposition Dewpoint Location	37.49 N 96.20 W
Transposition Maximum Dewpoint	79.5 F
Basin Elevation	1,300
Transposition to Basin Adjustment Factor	0.96
Higher of Basin Elevation - Inflow Barrier Height	1,300
Elevation Adjustment Factor	1.00
Total Adjustment Factor	1.11

Collinsville, IL August 12, 1946 Inflow



Cooper, MI August 31, 1914
Storm Type: MCC

Storm Name:	**Cooper, MI**
Storm Date:	**31-Aug-1914**
AWA Analysis Date:	**12/2/2008**

Storm Adjustment for Nebraska Grid Point 10

Temporal Transposition Date **16-Aug**

	Lat	Long
Storm center location	**42.38 N**	**85.61 W**
Storm Rep dew point location	**39.78 N**	**88.94 W**
Transposition dewpoint location	**37.51 N**	**98.34 W**
Basin location	**41.25 N**	**96.66 W**

Moisture Inflow Direction:	**SW @ 250**	miles
Basin Elevation	**1,300**	feet
Storm Elevation	**1,500**	feet
Storm Duration	**6hr**	feet

The storm representative dew point is	**77.0 F**	with total precipitable water above sea level of			**3.14**	inches.
The in-place maximum dew point is	**82.0 F**	with total precipitable water above sea level of			**3.92**	inches.
The transpositioned maximum dew point is	**81.5 F**	with total precipitable water above sea level of			**3.84**	inches.
The in-place storm elevation is	**1,500**	which subtracts	**0.39**	inches of precipitable water at	**77.0 F**	
The in-place storm elevation is	**1,500**	which subtracts	**0.45**	inches of precipitable water at	**82.0 F**	
The transposition basin elevation at	**1,300**	which subtracts	**0.395**	inches of precipitable water at	**81.5 F**	
The inflow barrier/basin elevation height is	**1,300**	which subtracts	**0.395**	inches of precipitable water at	**81.5 F**	

The in-place storm maximization factor is	**1.26**
The transposition/elevation to basin factor is	**0.99**
The barrier adjustment factor is	**1.00**
The total adjustment factor is	**1.25**

Notes: DAD values taken from USACE GL 2-16

Observed Storm Depth-Area-Duration

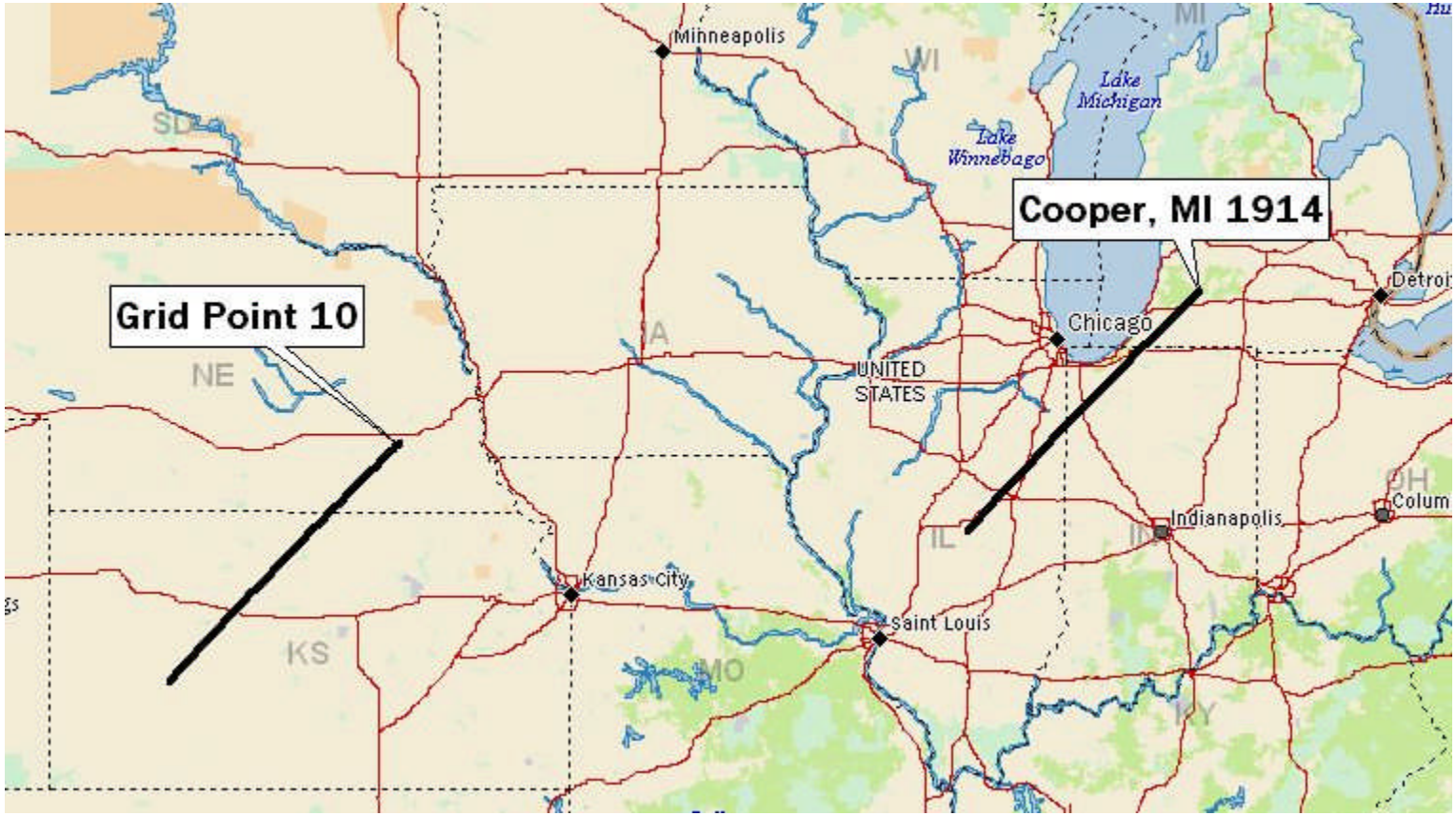
	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**12.6**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
100 sq miles	**11.3**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
200 sq miles	**10.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
500 sq miles	**7.6**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
1000 sq miles	**5.7**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
5000 sq miles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
10000 sq miles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
20000 sq miles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Adjusted Storm Depth-Area-Duration

	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**15.8**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
100 sq miles	**14.2**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
200 sq miles	**12.5**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
500 sq miles	**9.5**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
1000 sq miles	**7.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
5000 sq miles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
10000 sq miles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
20000 sq miles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Storm or Storm Center Name	**Cooper, MI**	
Storm Date(s)	31-Aug-1914	
Storm Type	MCS	
Storm Location	42.38 N	85.61 W
Storm Center Elevation	1,500	
Precipitation Total & Duration	12.60 Inches 6-hours USACE GL 2-16	
Storm Representative Dewpoint	77.0 F	6hr average, added 7°F to storm rep Td as reported by USACE based on ERPI and Wanahoo guidance
Storm Representative Dewpoint Location	39.78 N	88.94 W
Maximum Dewpoint	82.0 F	
Moisture Inflow Vector	SW @ 250 Miles	
In-place Maximization Factor	1.26	
Temporal Transposition (Date)	16-Aug	
Transposition Dewpoint Location	37.51 N	98.34 W
Transposition Maximum Dewpoint	81.5 F	
Basin Elevation	1,300	
Transposition to Basin Adjustment Factor	0.99	
Higher of Basin Elevation - Inflow Barrier Height	1,300	
Elevation Adjustment Factor	1.00	
Total Adjustment Factor	1.25	

Cooper, MI August 31, 1914 Inflow



WAR DEPARTMENT CORPS OF ENGINEERS, U. S. ARMY

STORM STUDIES - PERTINENT DATA SHEET

LOCATION MAP

Storm of 31 Aug.-1 Sept. 1914
Assignment GL 2-16
Location Michigan
Study Prepared by:
Great Lakes Division
Milwaukee District Office and
Hydrometeorological Section of
U. S. Weather Bureau.
Part I Reviewed by H. M. Sec. of Weather Bureau, 10/26/39
Part II Approved by Office, Chief of Engineers for Distribution of Factual Data, 10/26/46
Remarks: Centers near
Cooper and Bloomingdale, Mich.

DATA AND COMPUTATIONS COMPILED

PART I

Preliminary isohyetal map, in 1 sheet, scale 1 : 2,500,000

Precipitation data and mass curves: (Number of Sheets)

Form 5001-C (Hourly precip. data)	8
Form 5001-B (24-hour " ")	5
Form 5001-D (" " " ")	-
Misc. precip. records, meteorological data, etc.	6
Form 5002 (Mass rainfall curves)	4

PART II

Final isohyetal maps, in 1 sheet, scale 1 : 1,000,000

Data and computation sheets:

Form S-10 (Data from mass rainfall curves)	2
Form S-11 (Depth-area data from isohyetal map)	-
Form S-12 (Maximum depth-duration data)	-
Maximum duration-depth-area curves	1
Data relating to periods of maximum rainfall	-

MAXIMUM AVERAGE DEPTH OF RAINFALL IN INCHES

Area in Sq. Mi.	Duration of Rainfall in Hours										
	6										
10	12.6										
50	12.0										
100	11.3										
200	10.0										
500	7.6										
800	6.3										
1,000	5.7										
1,200	5.2										

Form S-2

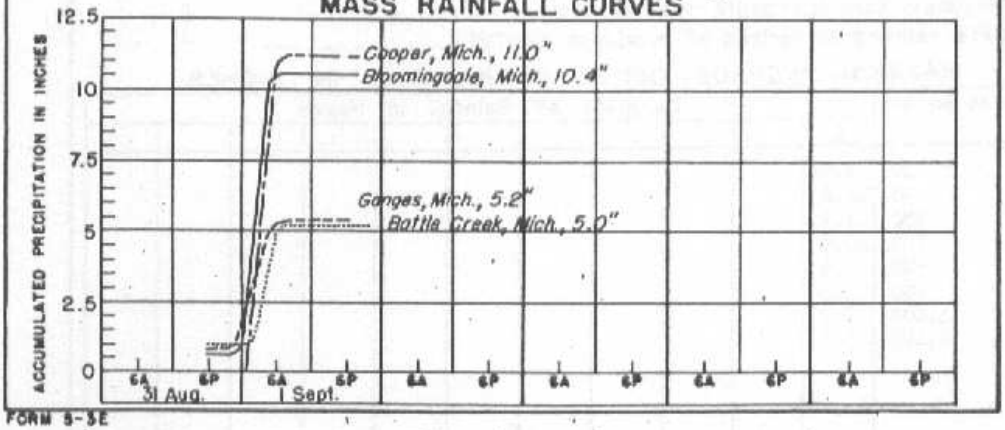
WAR DEPARTMENT — CORPS OF ENGINEERS, U. S. ARMY

STORM STUDIES - ISOHYETAL MAP

Storm of Aug. 31-Sept. 1, 1914 Assignment GL 2-16

Study Prepared by: Milwaukee, Wisc. District
Great Lakes Division

MASS RAINFALL CURVES



FORM 8-3E

Council Grove, KS July 9, 1951
Storm Type: Synoptic

Storm Name:	**Council Grove, KS**
Storm Date:	**09-Jul-1951**
AWA Analysis Date:	**12/2/2008**

Storm Adjustment for Grid Point 10

Temporal Transposition Date **24-Jul**

	Lat	Long
Storm center location	**38.66 N**	**96.49 W**
Storm Rep dew point location	**35.91 N**	**97.90 W**
Transposition dewpoint location	**38.45 N**	**97.87 W**
Basin location	**41.25 N**	**96.66 W**

Moisture Inflow Direction:	**SSW @ 205**	miles
Basin Elevation	**1,300**	feet
Storm Elevation	**1,200**	feet
Storm Duration	**24hr**	feet

The storm representative dew point is	**75.0 F**	with total precipitable water above sea level of			**2.85**	inches.
The in-place maximum dew point is	**78.0 F**	with total precipitable water above sea level of			**3.29**	inches.
The transpositioned maximum dew point is	**78.5 F**	with total precipitable water above sea level of			**3.37**	inches.
The in-place storm elevation is	**1,200**	which subtracts	**0.3**	inches of precipitable water at	**75.0 F**	
The in-place storm elevation is	**1,200**	which subtracts	**0.33**	inches of precipitable water at	**78.0 F**	
The transposition basin elevation at	**1,300**	which subtracts	**0.365**	inches of precipitable water at	**78.5 F**	
The inflow barrier/basin elevation height is	**1,300**	which subtracts	**0.365**	inches of precipitable water at	**78.5 F**	

The in-place storm maximization factor is	**1.16**
The transposition/elevation to basin factor is	**1.02**
The barrier adjustment factor is	**1.00**
The total adjustment factor is	**1.18**

Notes: DAD values taken from USACE MR 10-2

Observed Storm Depth-Area-Duration

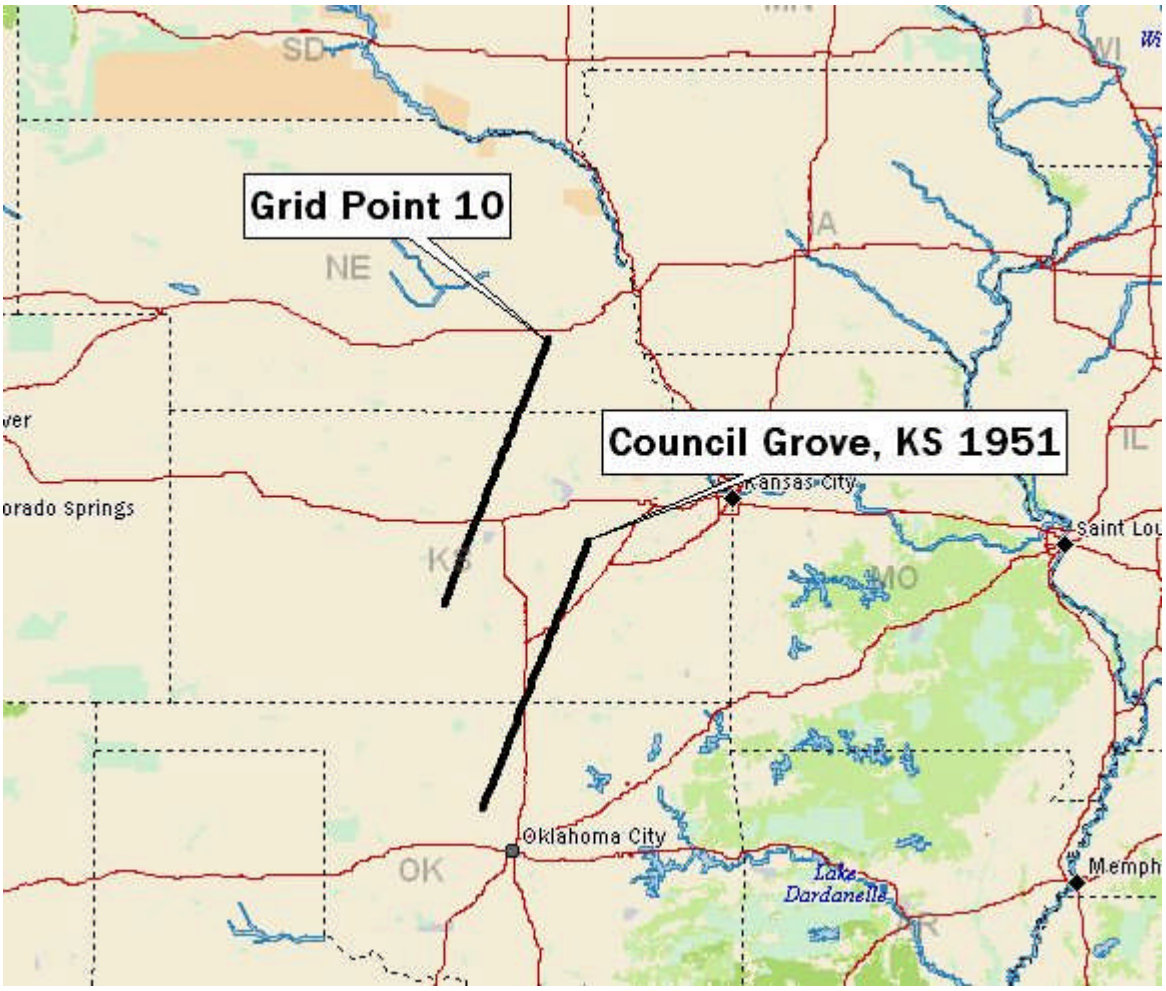
	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**5.3**	**7.0**	**7.9**	**8.6**	**11.8**	**13.1**	**14.3**	**17.2**	**18.2**
100 sq miles	**4.7**	**6.4**	**7.4**	**7.9**	**10.6**	**12.4**	**13.8**	**16.3**	**17.5**
200 sq miles	**4.6**	**6.2**	**7.2**	**7.5**	**10.2**	**12.0**	**13.3**	**15.9**	**17.0**
500 sq miles	**4.3**	**5.8**	**6.7**	**7.0**	**9.5**	**11.3**	**12.4**	**15.0**	**16.2**
1000 sq miles	**4.0**	**5.5**	**6.3**	**6.6**	**9.0**	**10.5**	**11.5**	**14.2**	**15.5**
5000 sq miles	**3.4**	**4.5**	**5.1**	**5.4**	**7.2**	**8.4**	**9.3**	**11.7**	**13.0**
10000 sq miles	**2.9**	**3.9**	**4.4**	**4.8**	**6.2**	**7.3**	**8.2**	**10.4**	**11.4**
20000 sq miles	**2.4**	**3.2**	**3.7**	**4.1**	**5.1**	**6.1**	**6.9**	**8.6**	**9.4**

Adjusted Storm Depth-Area-Duration

	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**6.2**	**8.2**	**9.3**	**10.1**	**13.9**	**15.4**	**16.9**	**20.3**	**21.4**
100 sq miles	**5.5**	**7.5**	**8.7**	**9.3**	**12.5**	**14.6**	**16.3**	**19.2**	**20.6**
200 sq miles	**5.4**	**7.3**	**8.5**	**8.8**	**12.0**	**14.1**	**15.7**	**18.7**	**20.0**
500 sq miles	**5.1**	**6.8**	**7.9**	**8.2**	**11.2**	**13.3**	**14.6**	**17.7**	**19.1**
1000 sq miles	**4.7**	**6.5**	**7.4**	**7.8**	**10.6**	**12.4**	**13.6**	**16.7**	**18.3**
5000 sq miles	**4.0**	**5.3**	**6.0**	**6.4**	**8.5**	**9.9**	**11.0**	**13.8**	**15.3**
10000 sq miles	**3.4**	**4.6**	**5.2**	**5.7**	**7.3**	**8.6**	**9.7**	**12.3**	**13.4**
20000 sq miles	**2.8**	**3.8**	**4.4**	**4.8**	**6.0**	**7.2**	**8.1**	**10.1**	**11.1**

Storm or Storm Center Name	**Council Grove, KS**
Storm Date(s)	9-Jul-1951
Storm Type	Synoptic
Storm Location	38.66 N 96.49 W
Storm Center Elevation	1,200
Precipitation Total & Duration	18.50 Inches 72-hours USACE MR 10-2
Storm Representative Dewpoint	75.0 F 24hr average
Storm Representative Dewpoint Location	35.91 N 97.90 W
Maximum Dewpoint	78.0 F
Moisture Inflow Vector	SSW @ 205 Miles
In-place Maximization Factor	1.16
Temporal Transposition (Date)	24-Jul
Transposition Dewpoint Location	38.45 N 97.87 W
Transposition Maximum Dewpoint	78.5 F
Basin Elevation	1,300
Transposition to Basin Adjustment Factor	1.02
Higher of Basin Elevation - Inflow Barrier Height	1,300
Elevation Adjustment Factor	1.00
Total Adjustment Factor	1.18

Council Grove, KS July 9, 1951 Inflow



DEPARTMENT OF THE ARMY — CORPS OF ENGINEERS

STORM STUDIES - PERTINENT DATA SHEET

LOCATION MAP

Storm of 9-13 July 1951
Assignment MR 10-2
Location Kans., Nebr. Mo.
Study Prepared by:
Missouri River Division
Kansas City District Office

Part I Reviewed by H. M. Sec. of Weather Bureau, 10/29/51
Part II Approved by Office, Chief of Engineers for Distribution of Factual Data, 12/10/52
Remarks: Center near Council Grove, Kans. Dewpt. 73°F-Ref.Pt. 205 SSW Grid F-16

DATA AND COMPUTATIONS COMPILED

PART I

Preliminary isohyetal map, in 1 sheet, scale 1: 1,000,000

Precipitation data and mass curves:	(Number of Sheets)
Form 5001-C (Hourly precip. data)	78
Form 5001-B (24-hour " ")	-
Form 5001-D (" " " ")	2
Misc. precip. records, meteorological data, etc.	151
Form 5002 (Mass rainfall curves)	61

PART II

Final isohyetal maps, in 1 sheet, scale 1: 1,000,000

Data and computation sheets:

Form S-10 (Data from mass rainfall curves)	7
Form S-11 (Depth-area data from isohyetal map)	2
Form S-12 (Maximum depth-duration data)	11
Maximum duration-depth-area curves	1
Data relating to periods of maximum rainfall	6

MAXIMUM AVERAGE DEPTH OF RAINFALL IN INCHES

Area in Sq. Mi.	Duration of Rainfall in Hours										
	6	12	18	24	30	36	48	60	72	96	108
Max. Station	5.8	7.5	8.2	9.3	13.1	13.5	14.4	17.9	18.5	18.5	18.5
10	5.3	7.0	7.9	8.6	11.8	13.1	14.3	17.2	18.2	18.2	18.2
100	4.7	6.4	7.4	7.9	10.6	12.4	13.8	16.3	17.5	17.5	17.5
200	4.6	6.2	7.2	7.5	10.2	12.0	13.3	15.9	17.0	17.0	17.0
500	4.3	5.8	6.7	7.0	9.5	11.3	12.4	15.0	16.2	16.2	16.2
1,000	4.0	5.5	6.3	6.6	9.0	10.5	11.5	14.2	15.5	15.5	15.5
2,000	3.8	5.1	5.9	6.2	8.3	9.6	10.5	13.1	14.6	14.6	14.6
5,000	3.4	4.5	5.1	5.4	7.2	8.4	9.3	11.7	13.0	13.1	13.1
10,000	2.9	3.9	4.4	4.8	6.2	7.3	8.2	10.4	11.4	11.5	11.5
20,000	2.4	3.2	3.7	4.1	5.1	6.1	6.9	8.6	9.4	9.6	9.6
50,000	1.3	2.0	2.5	2.8	3.4	4.0	4.7	5.8	6.3	6.5	6.5
57,000	1.1	1.7	2.3	2.5	3.0	3.8	4.4	5.4	5.9	6.0	6.0

Form S-2

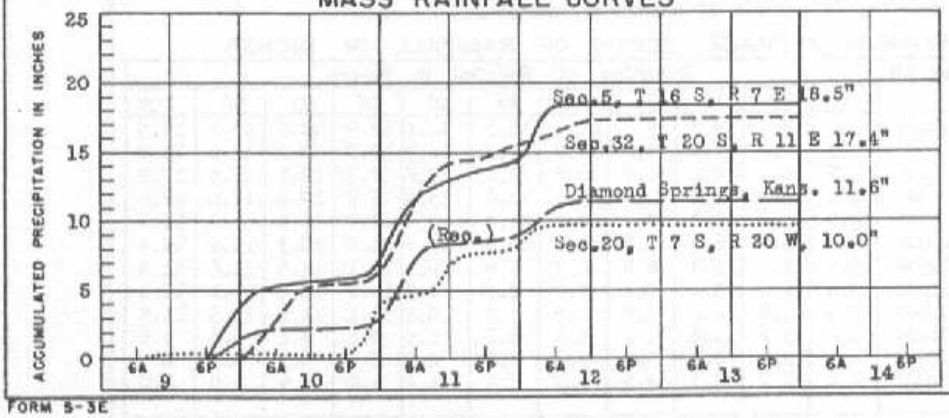
DEPARTMENT OF THE ARMY — CORPS OF ENGINEERS

STORM STUDIES - ISOHYETAL MAP

Storm of 9-13 July 1951 — Assignment MR 10-2

Study Prepared by: Kansas City, Mo. District
Missouri River Division

MASS RAINFALL CURVES



FORM 5-3E

David City, NE June 24, 1963
Storm Type: MCC

Storm Name:	**David City, NE**
Storm Date:	**24-Jun-1963**
AWA Analysis Date:	**12/2/2008**

Storm Adjustment for Nebraska Grid Point 10

Temporal Transposition Date **9-Jul**

	Lat	Long
Storm center location	**41.23 N**	**97.11 W**
Storm Rep dew point location	**39.407 N**	**94.829 W**
Transposition dewpoint location	**39.415 N**	**94.432 W**
Basin location	**41.25 N**	**96.66 W**

Moisture Inflow Direction:	**SE @ 175 M**	miles
Basin Elevation	**1,300**	feet
Storm Elevation	**1,630**	feet
Storm Duration	**6hr**	feet

The storm representative dew point is	**73.5 F**	with total precipitable water above sea level of			**2.67**	inches.
The in-place maximum dew point is	**83.0 F**	with total precipitable water above sea level of			**4.08**	inches.
The transpositioned maximum dew point is	**82.5 F**	with total precipitable water above sea level of			**4.00**	inches.
The in-place storm elevation is	**1,630**	which subtracts	**0.375**	inches of precipitable water at	**73.5 F**	
The in-place storm elevation is	**1,630**	which subtracts	**0.49**	inches of precipitable water at	**83.0 F**	
The transposition basin elevation at	**1,300**	which subtracts	**0.405**	inches of precipitable water at	**82.5 F**	
The inflow barrier/basin elevation height is	**1,300**	which subtracts	**0.405**	inches of precipitable water at	**82.5 F**	

The in-place storm maximization factor is	**1.50**
The transposition/elevation to basin factor is	**1.00**
The barrier adjustment factor is	**1.00**
The total adjustment factor is	**1.50**

In place of 1.56 adjusted to 1.50 based on HMR 51 and 55A guidance. DAD values taken from SPAS 1030.

Observed Storm Depth-Area-Duration

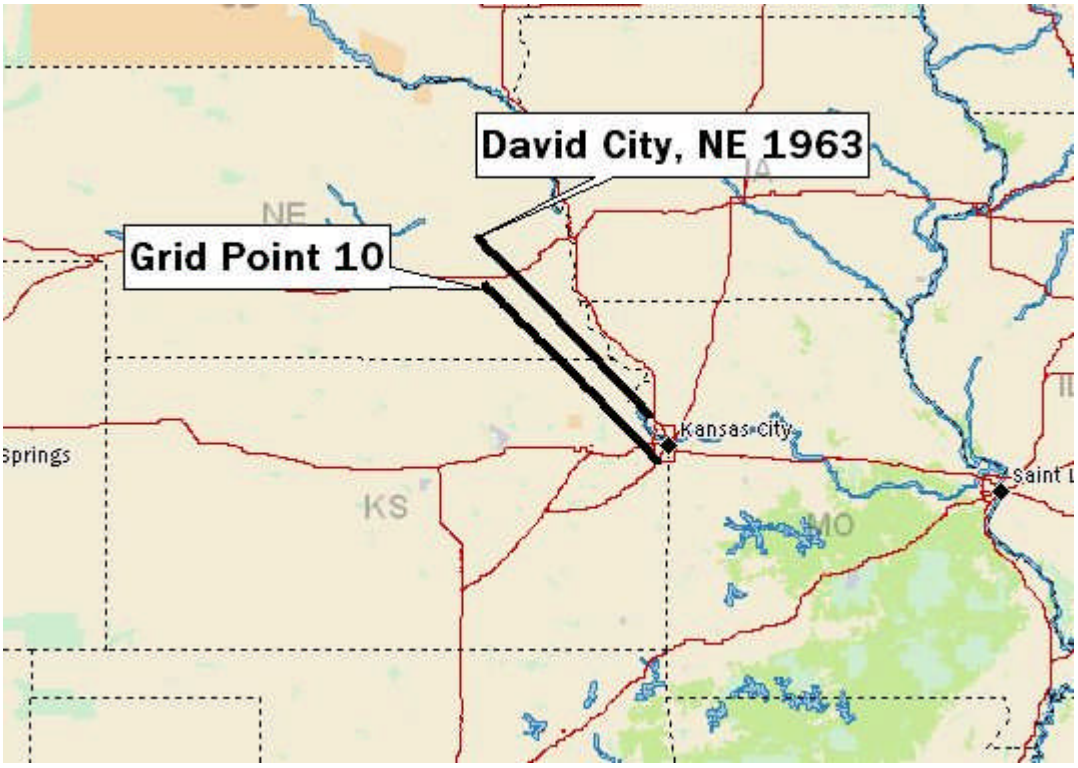
	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**13.3**	**14.6**	**15.0**	**15.2**	**0.0**	**15.2**	**15.2**	**0.0**	**15.2**
100 sq miles	**11.2**	**12.7**	**13.1**	**13.2**	**0.0**	**13.2**	**13.2**	**0.0**	**13.2**
200 sq miles	**10.5**	**12.0**	**12.4**	**12.5**	**0.0**	**12.5**	**12.5**	**0.0**	**12.5**
500 sq miles	**9.0**	**10.4**	**10.8**	**10.8**	**0.0**	**10.8**	**10.9**	**0.0**	**10.9**
1000 sq miles	**7.8**	**9.0**	**9.4**	**9.5**	**0.0**	**9.5**	**9.5**	**0.0**	**9.5**
5000 sq miles	**4.2**	**5.9**	**6.6**	**6.8**	**0.0**	**6.9**	**6.9**	**0.0**	**6.9**
10000 sq miles	**2.6**	**4.1**	**4.6**	**4.9**	**0.0**	**4.9**	**5.0**	**0.0**	**5.0**
20000 sq miles	**1.5**	**2.4**	**2.9**	**3.1**	**0.0**	**3.1**	**3.1**	**0.0**	**3.1**

Adjusted Storm Depth-Area-Duration

	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**20.0**	**22.0**	**22.5**	**22.8**	**0.0**	**22.8**	**22.8**	**0.0**	**22.8**
100 sq miles	**16.9**	**19.1**	**19.7**	**19.9**	**0.0**	**19.9**	**19.9**	**0.0**	**19.9**
200 sq miles	**15.7**	**18.0**	**18.6**	**18.8**	**0.0**	**18.8**	**18.8**	**0.0**	**18.8**
500 sq miles	**13.5**	**15.7**	**16.2**	**16.3**	**0.0**	**16.3**	**16.3**	**0.0**	**16.3**
1000 sq miles	**11.7**	**13.5**	**14.1**	**14.2**	**0.0**	**14.2**	**14.2**	**0.0**	**14.3**
5000 sq miles	**6.3**	**8.9**	**9.9**	**10.2**	**0.0**	**10.3**	**10.3**	**0.0**	**10.3**
10000 sq miles	**4.0**	**6.2**	**6.9**	**7.4**	**0.0**	**7.4**	**7.5**	**0.0**	**7.5**
20000 sq miles	**2.3**	**3.7**	**4.3**	**4.7**	**0.0**	**4.7**	**4.7**	**0.0**	**4.7**

Storm or Storm Center Name	**David City, NE**	
Storm Date(s)	24-Jun-1963	
Storm Type	MCC	
Storm Location	41.23 N	97.11 W
Storm Center Elevation	1,630	
Precipitation Total & Duration	16.50 Inches 24-hours USACE Bcket Survey Data	
Storm Representative Dewpoint	73.5 F	6hr average
Storm Representative Dewpoint Location	39.407 N	94.829 W
Maximum Dewpoint	83.0 F	
Moisture Inflow Vector	SE @ 175 Miles	
In-place Maximization Factor	1.50	
Temporal Transposition (Date)	9-Jul	
Transposition Dewpoint Location	39.415 N	94.432 W
Transposition Maximum Dewpoint	82.5 F	
Basin Elevation	1,300	
Transposition to Basin Adjustment Factor	1.00	
Higher of Basin Elevation - Inflow Barrier Height	1,300	
Elevation Adjustment Factor	1.00	
Total Adjustment Factor	1.50	

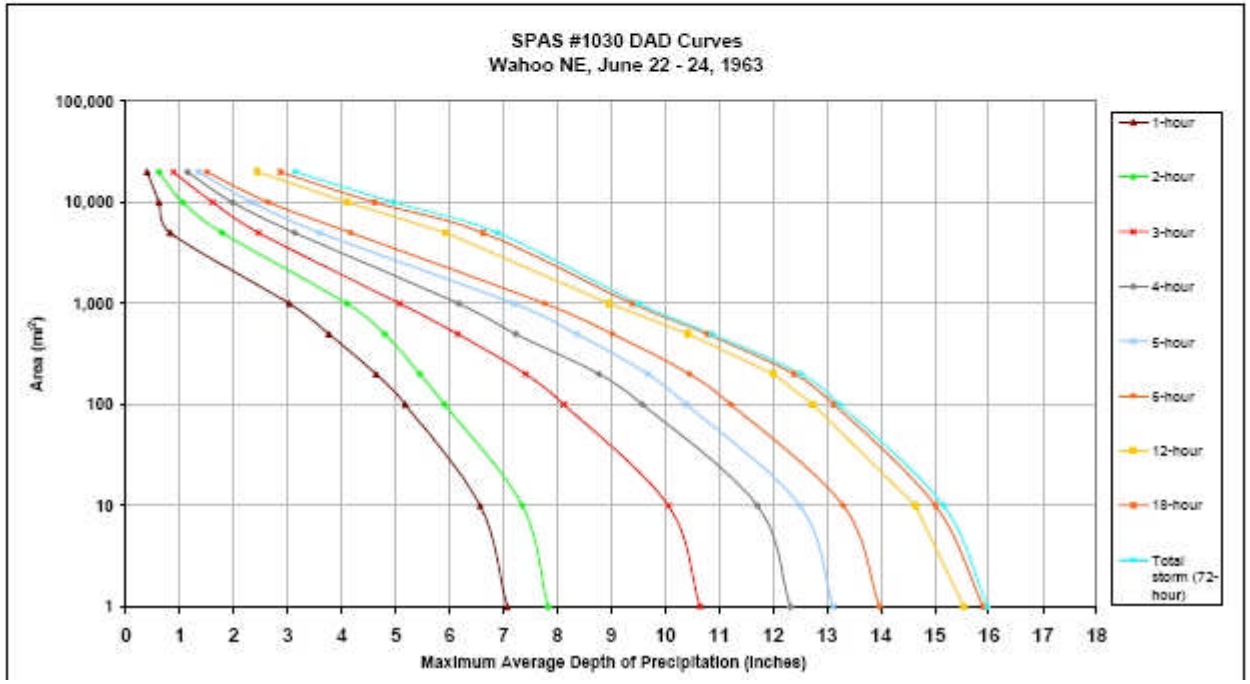
David City, NE June 24, 1963 Inflow

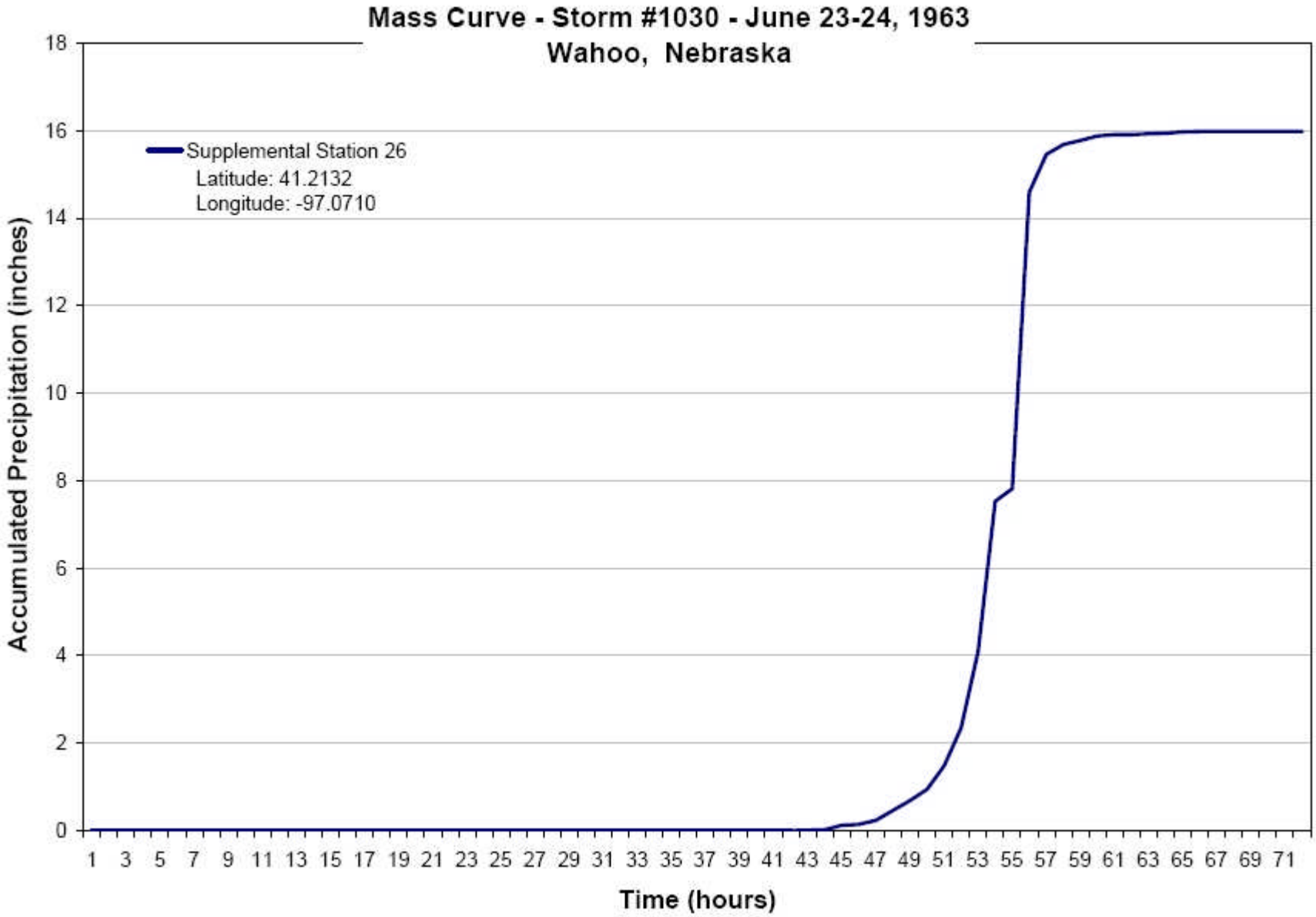


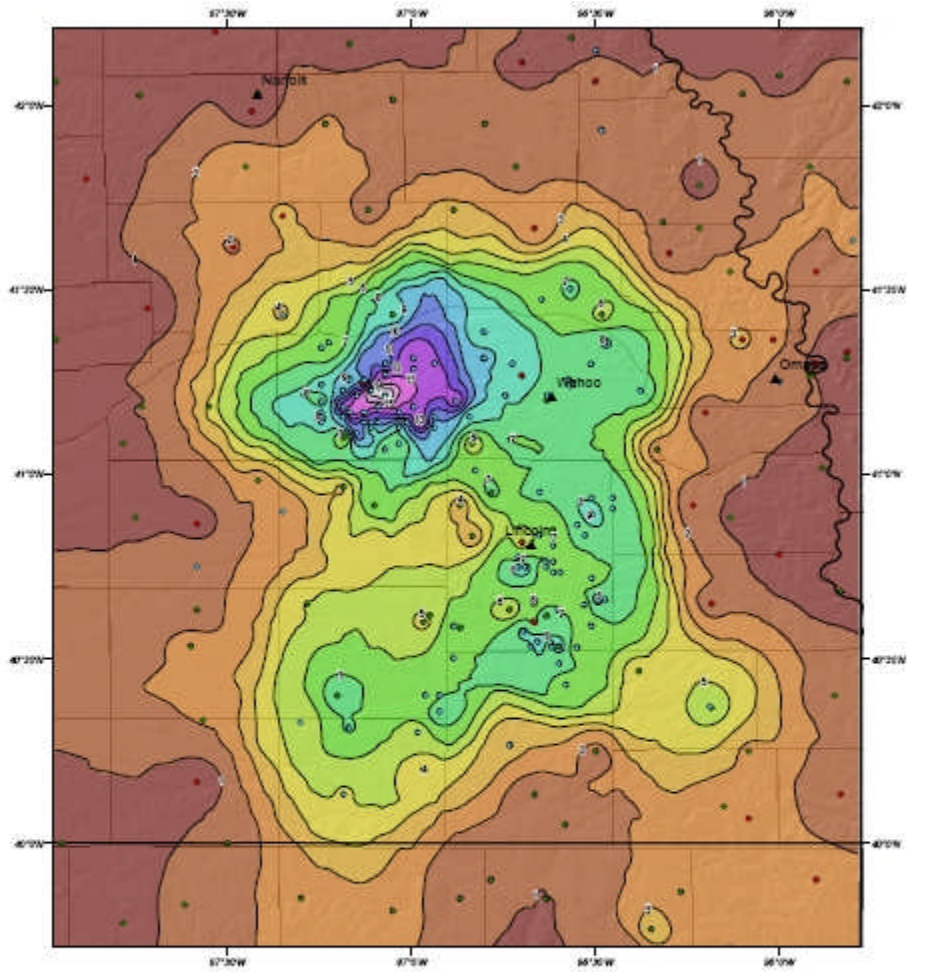
Storm 1030 - Wahoo NE, June 22 - 24, 1963

MAXIMUM AVERAGE DEPTH OF PRECIPITATION (INCHES)

Area (mi²)	Duration (hours)												
	1	2	3	4	5	6	12	18	24	36	48	72	total
1	7.07	7.83	10.65	12.32	13.12	13.96	15.54	15.90	15.96	15.96	15.96	15.96	15.96
10	6.57	7.35	10.06	11.71	12.50	13.30	14.64	15.01	15.15	15.13	15.13	15.16	15.16
100	5.18	5.91	8.12	9.58	10.39	11.22	12.74	13.13	13.23	13.23	13.23	13.23	13.23
200	4.64	5.45	7.41	8.77	9.66	10.45	12.01	12.39	12.49	12.49	12.50	12.52	12.52
500	3.76	4.80	6.15	7.23	8.36	9.02	10.43	10.78	10.82	10.84	10.86	10.87	10.87
1,000	3.03	4.10	5.08	6.17	7.19	7.77	8.96	9.39	9.45	9.47	9.48	9.51	9.51
5,000	0.82	1.76	2.46	3.13	3.59	4.17	5.93	6.62	6.80	6.85	6.88	6.88	6.88
10,000	0.61	1.05	1.61	1.98	2.34	2.64	4.11	4.61	4.92	4.94	4.96	4.96	4.96
20,000	0.39	0.61	0.88	1.14	1.34	1.50	2.44	2.86	3.11	3.12	3.13	3.14	3.14




Mass Curve - Storm #1030 - June 23-24, 1963
Wahoo, Nebraska
Supplemental Station 26
Latitude: 41.2132
Longitude: -97.0710
Accumulated Precipitation (inches)
0
2
4
6
8
10
12
14
16
18
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49 51 53 55 57 59 61 63 65 67 69 71
Time (hours)



SPAS Storm #1030 - June 22 to 24, 1963
Total Rainfall (72-hours) - Wahoo, Nebraska

Edgerton, MO July 18, 1965
Storm Type: Hybrid

Storm Name:	**Edgerton, MO**
Storm Date:	**17-Jul-1965**
AWA Analysis Date:	**12/2/2008**

Storm Adjustment for Nebraska Grid Point 10

Temporal Transposition Date **16-Jul**

	Lat	Long
Storm center location	**39.51 N**	**94.63 W**
Storm Rep dew point location	**38.89 N**	**95.42 W**
Transposition dewpoint location	**40.13 N**	**97.79 W**
Basin location	**41.25 N**	**96.66 W**

Moisture Inflow Direction:	**SW @ 60**	miles
Basin Elevation	**1,300**	feet
Storm Elevation	**900**	feet
Storm Duration	**24hr**	feet

The storm representative dew point is	**71.0 F**	with total precipitable water above sea level of				**2.36**	inches.
The in-place maximum dew point is	**79.5 F**	with total precipitable water above sea level of				**3.52**	inches.
The transpositioned maximum dew point is	**79.0 F**	with total precipitable water above sea level of				**3.44**	inches.
The in-place storm elevation is	**900**	which subtracts	**0.2**	inches of precipitable water at		**71.0 F**	
The in-place storm elevation is	**900**	which subtracts	**0.265**	inches of precipitable water at		**79.5 F**	
The transposition basin elevation at	**1,300**	which subtracts	**0.37**	inches of precipitable water at		**79.0 F**	
The inflow barrier/basin elevation height is	**1,300**	which subtracts	**0.37**	inches of precipitable water at		**79.0 F**	

The in-place storm maximization factor is	**1.50**
The transposition/elevation to basin factor is	**0.94**
The barrier adjustment factor is	**1.00**
The total adjustment factor is	**1.41**

Notes: DAD values taken from EPRI Storm Number 20

Observed Storm Depth-Area-Duration

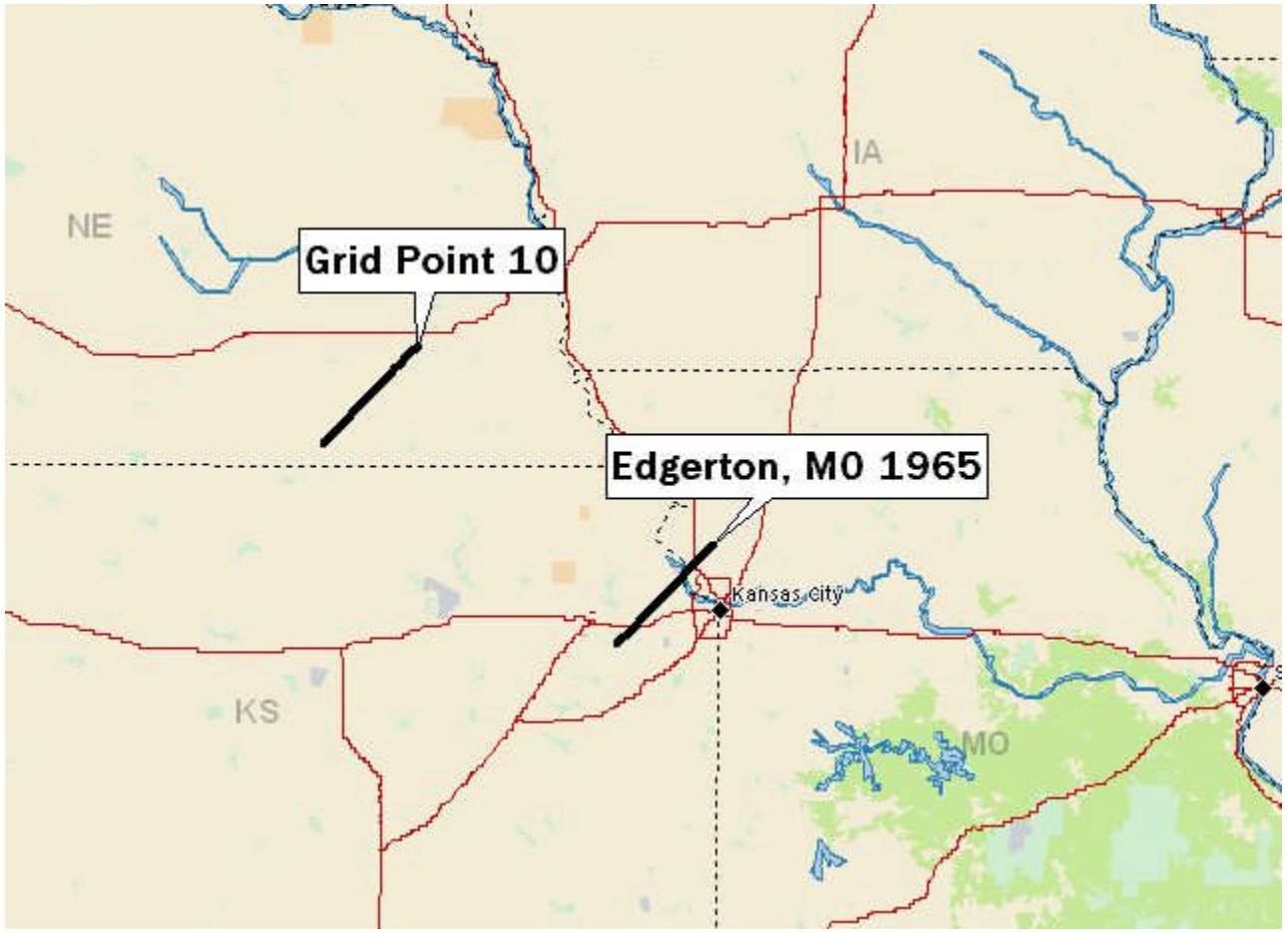
	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
100 sq miles	**8.2**	**9.5**	**0.0**	**13.9**	**0.0**	**0.0**	**16.5**	**0.0**	**16.5**
200 sq miles	**7.7**	**8.9**	**0.0**	**12.7**	**0.0**	**0.0**	**15.1**	**0.0**	**15.1**
500 sq miles	**6.9**	**8.0**	**0.0**	**11.4**	**0.0**	**0.0**	**13.4**	**0.0**	**13.4**
1000 sq miles	**6.2**	**7.2**	**0.0**	**10.4**	**0.0**	**0.0**	**12.5**	**0.0**	**12.5**
5000 sq miles	**3.4**	**4.6**	**0.0**	**7.9**	**0.0**	**0.0**	**10.3**	**0.0**	**10.3**
10000 sq miles	**2.1**	**3.2**	**0.0**	**6.1**	**0.0**	**0.0**	**8.1**	**0.0**	**8.1**
20000 sq miles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Adjusted Storm Depth-Area-Duration

	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
100 sq miles	**11.6**	**13.4**	**0.0**	**19.7**	**0.0**	**0.0**	**23.3**	**0.0**	**23.3**
200 sq miles	**10.9**	**12.6**	**0.0**	**18.0**	**0.0**	**0.0**	**21.4**	**0.0**	**21.4**
500 sq miles	**9.8**	**11.3**	**0.0**	**16.1**	**0.0**	**0.0**	**19.0**	**0.0**	**19.0**
1000 sq miles	**8.8**	**10.2**	**0.0**	**14.7**	**0.0**	**0.0**	**17.7**	**0.0**	**17.7**
5000 sq miles	**4.8**	**6.5**	**0.0**	**11.2**	**0.0**	**0.0**	**14.6**	**0.0**	**14.6**
10000 sq miles	**3.0**	**4.5**	**0.0**	**8.6**	**0.0**	**0.0**	**11.5**	**0.0**	**11.5**
20000 sq miles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Storm or Storm Center Name	**Edgerton, MO**	
Storm Date(s)	17-Jul-1965	
Storm Type	Synoptic	
Storm Location	39.51 N	94.63 W
Storm Center Elevation	900	
Precipitation Total & Duration	20.02 Inches 72-hours EPRI Storm Number 20	
Storm Representative Dewpoint	71.0 F	24hr average
Storm Representative Dewpoint Location	38.89 N	95.42 W
Maximum Dewpoint	79.5 F	
Moisture Inflow Vector	SW @ 60 Miles	
In-place Maximization Factor	1.50	
Temporal Transposition (Date)	16-Jul	
Transposition Dewpoint Location	40.13 N	97.79 W
Transposition Maximum Dewpoint	79.0 F	
Basin Elevation	1,300	
Transposition to Basin Adjustment Factor	0.94	
Higher of Basin Elevation - Inflow Barrier Height	1,300	
Elevation Adjustment Factor	1.00	
Total Adjustment Factor	1.41	

Edgerton, MO July 18, 1965 Inflow



Enid, OK October 10, 1973
Storm Type: Hybrid

Storm Name:	**Enid, OK**
Storm Date:	**10-Oct-1973**
AWA Analysis Date:	**12/2/2008**

Storm Adjustment for Grid Point 5

Temporal Transposition Date **1-Oct**

	Lat	Long
Storm center location	**36.38 N**	**97.87 W**
Storm Rep dew point location	**33.35 N**	**96.55 W**
Transposition dewpoint location	**36.22 N**	**93.68 W**
Basin location	**41.25 N**	**96.66 W**

Moisture Inflow Direction:	**SSE @ 225**	miles
Basin Elevation	**1,300**	feet
Storm Elevation	**1,250**	feet
Storm Duration	**12hr**	feet

The storm representative dew point is	**75.0 F**	with total precipitable water above sea level of			**2.85**	inches.
The in-place maximum dew point is	**76.5 F**	with total precipitable water above sea level of			**3.07**	inches.
The transpositioned maximum dew point is	**75.0 F**	with total precipitable water above sea level of			**2.92**	inches.
The in-place storm elevation is	**1,250**	which subtracts	**0.31**	inches of precipitable water at	**75.0 F**	
The in-place storm elevation is	**1,250**	which subtracts	**0.325**	inches of precipitable water at	**76.5 F**	
The transposition basin elevation at	**1,300**	which subtracts	**0.325**	inches of precipitable water at	**75.0 F**	
The inflow barrier/basin elevation height is	**1,300**	which subtracts	**0.325**	inches of precipitable water at	**75.0 F**	

The in-place storm maximization factor is	**1.08**
The transposition/elevation to basin factor is	**0.95**
The barrier adjustment factor is	**1.00**
The total adjustment factor is	**1.02**

Notes: DAD values taken from SPAS 1034.

Observed Storm Depth-Area-Duration

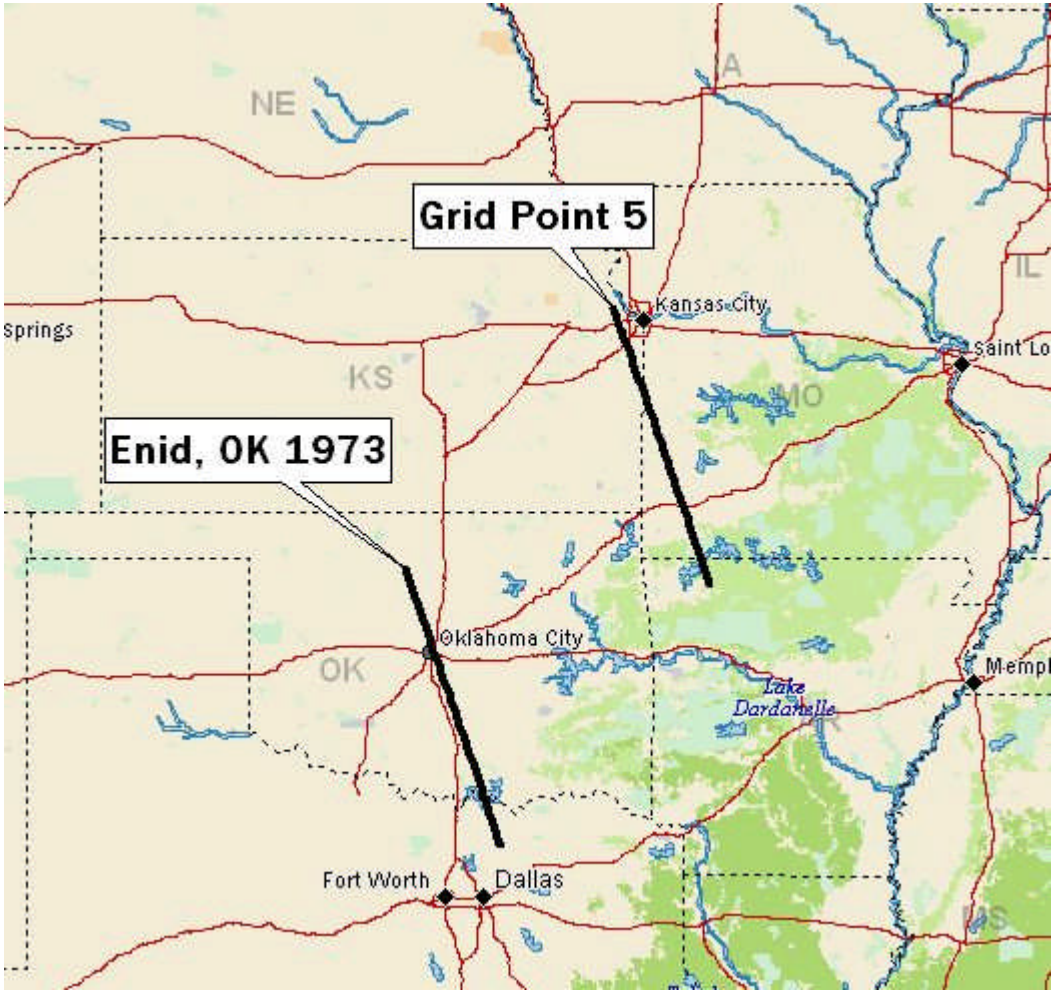
	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**10.7**	**16.3**	**18.1**	**18.1**	**0.0**	**18.1**	**18.3**	**0.0**	**18.5**
100 sq miles	**9.7**	**14.6**	**16.2**	**16.2**	**0.0**	**16.2**	**16.4**	**0.0**	**16.6**
200 sq miles	**9.1**	**13.7**	**15.2**	**15.2**	**0.0**	**15.2**	**15.3**	**0.0**	**15.5**
500 sq miles	**7.9**	**11.3**	**12.7**	**12.7**	**0.0**	**12.7**	**12.9**	**0.0**	**12.9**
1000 sq miles	**6.7**	**9.5**	**10.5**	**10.5**	**0.0**	**10.5**	**10.6**	**0.0**	**10.6**
5000 sq miles	**3.9**	**5.2**	**5.6**	**5.6**	**0.0**	**5.6**	**5.7**	**0.0**	**5.7**
10000 sq miles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
20000 sq miles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Adjusted Storm Depth-Area-Duration

	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**11.0**	**16.7**	**18.5**	**18.5**	**0.0**	**18.5**	**18.7**	**0.0**	**18.9**
100 sq miles	**9.9**	**15.0**	**16.6**	**16.6**	**0.0**	**16.6**	**16.7**	**0.0**	**16.9**
200 sq miles	**9.3**	**14.0**	**15.5**	**15.5**	**0.0**	**15.5**	**15.6**	**0.0**	**15.8**
500 sq miles	**8.1**	**11.6**	**13.0**	**13.0**	**0.0**	**13.0**	**13.1**	**0.0**	**13.2**
1000 sq miles	**6.9**	**9.7**	**10.8**	**10.8**	**0.0**	**10.8**	**10.8**	**0.0**	**10.9**
5000 sq miles	**4.0**	**5.3**	**5.8**	**5.8**	**0.0**	**5.8**	**5.8**	**0.0**	**5.8**
10000 sq miles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
20000 sq miles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Storm or Storm Center Name	**Enid, OK**	
Storm Date(s)	10-Oct-1973	
Storm Type	MCC	
Storm Location	36.38 N	97.87 W
Storm Center Elevation	1,250	
Precipitation Total & Duration	20.00 Inches 15-hours NCDC Storm Data report	
Storm Representative Dewpoint	75.0 F	12hr average taken from KDFW and WACO from 2100CDT 10-9-73 to 0900CDT10-10-73
Storm Representative Dewpoint Location	33.35 N	96.55 W
Maximum Dewpoint	76.5 F	
Moisture Inflow Vector	SSE @ 225 Miles	
In-place Maximization Factor	1.08	
Temporal Transposition (Date)	1-Oct	
Transposition Dewpoint Location	36.22 N	93.68 W
Transposition Maximum Dewpoint	75.0 F	
Basin Elevation	1,300	
Transposition to Basin Adjustment Factor	0.95	
Higher of Basin Elevation - Inflow Barrier Height	1,300	
Elevation Adjustment Factor	1.00	
Total Adjustment Factor	1.02	

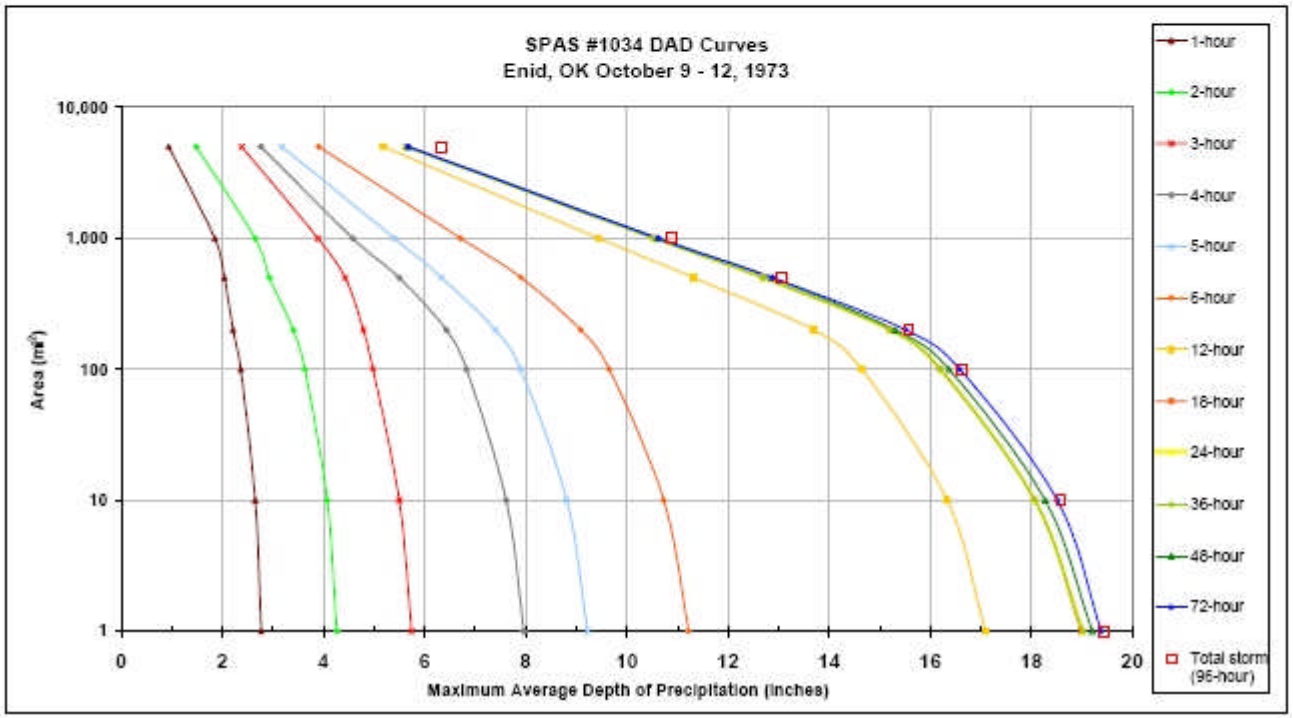
Enid, OK October 10, 1973 Inflow

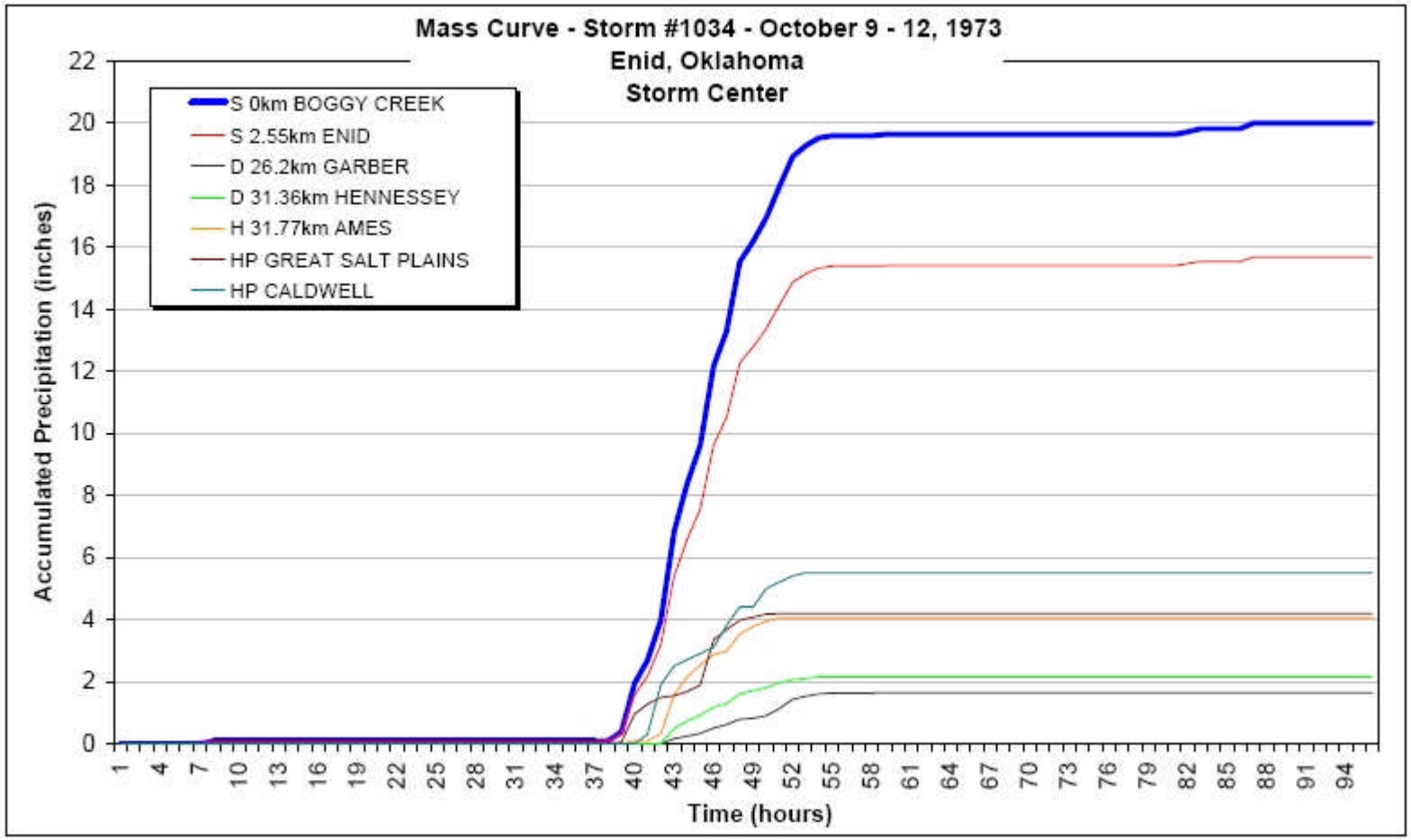


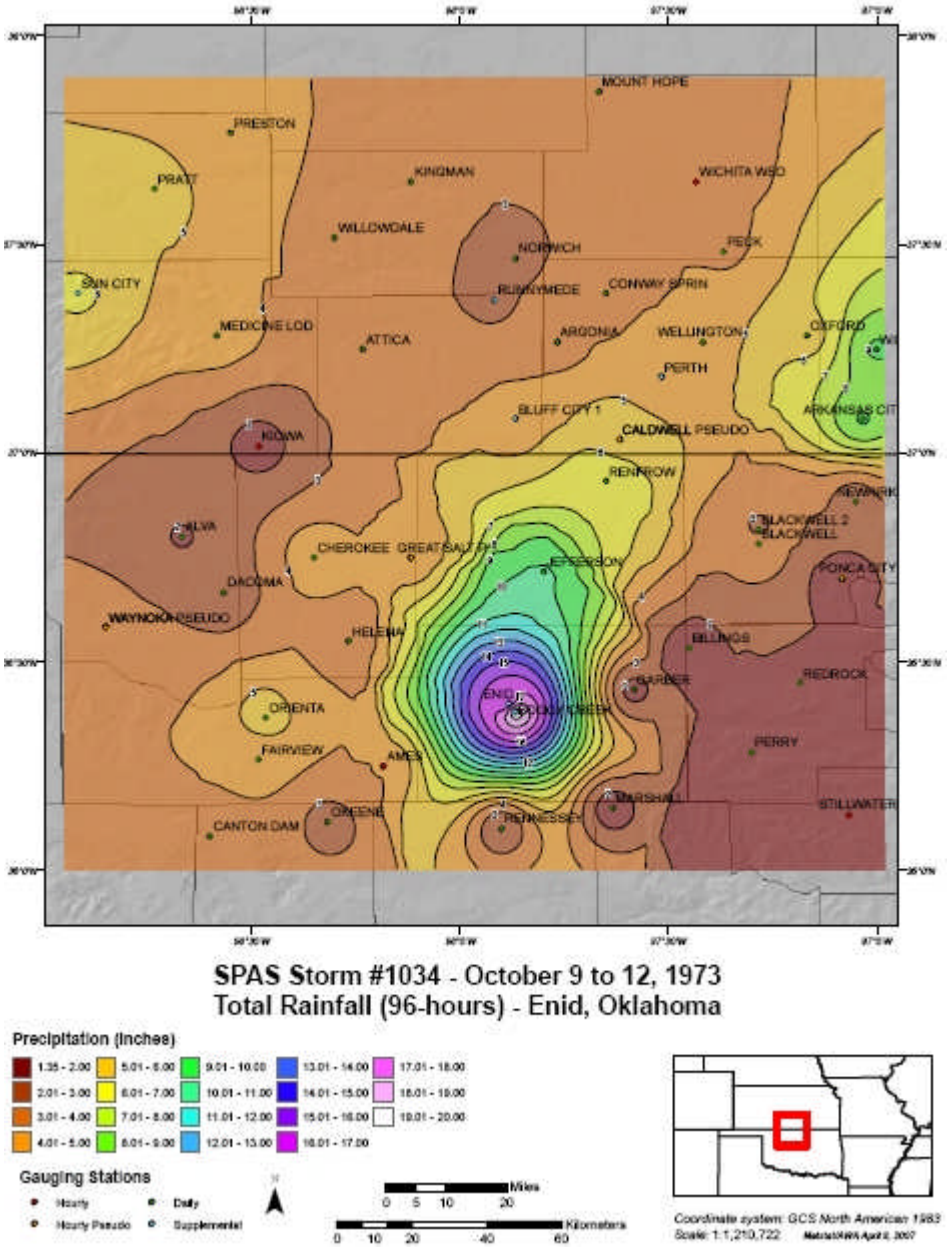
Storm 1034 - Enid OK, October 9 - 12, 1973

MAXIMUM AVERAGE DEPTH OF PRECIPITATION (INCHES)

Area (mi^2)	Duration (hours)													
	1	2	3	4	5	6	12	18	24	36	48	72	96	total
1	2.77	4.26	5.74	7.96	9.22	11.22	17.09	18.98	19.02	19.02	19.20	19.36	19.45	19.45
10	2.65	4.07	5.50	7.61	8.81	10.73	16.33	18.07	18.07	18.07	18.27	18.51	18.58	18.58
100	2.36	3.63	4.96	6.83	7.90	9.65	14.64	16.19	16.20	16.20	16.37	16.58	16.64	16.64
200	2.21	3.40	4.79	6.43	7.40	9.09	13.69	15.19	15.21	15.21	15.30	15.51	15.57	15.57
500	2.04	2.93	4.43	5.50	6.33	7.91	11.32	12.69	12.69	12.69	12.86	12.89	13.06	13.06
1,000	1.85	2.65	3.89	4.58	5.40	6.71	9.45	10.53	10.53	10.53	10.60	10.63	10.89	10.89
5,000	0.94	1.48	2.38	2.76	3.18	3.91	5.18	5.63	5.63	5.63	5.67	5.68	6.32	6.32




Mass Curve - Storm #1034 - October 9 - 12, 1973
Enid, Oklahoma
Storm Center
S 0km BOGGY CREEK
S 2.55km ENID
D 26.2km GARBER
D 31.36km HENNESSEY
H 31.77km AMES
HP GREAT SALT PLAINS
HP CALDWELL
Accumulated Precipitation (inches)
Time (hours)



SPAS Storm #1034 - October 9 to 12, 1973
Total Rainfall (96-hours) - Enid, Oklahoma

Precipitation (Inches)

1.35 - 2.00	5.01 - 6.00	9.01 - 10.00	13.01 - 14.00	17.01 - 18.00	
2.01 - 3.00	6.01 - 7.00	10.01 - 11.00	14.01 - 15.00	18.01 - 19.00	
3.01 - 4.00	7.01 - 8.00	11.01 - 12.00	15.01 - 16.00	19.01 - 20.00	
4.01 - 5.00	8.01 - 9.00	12.01 - 13.00	16.01 - 17.00		

Gauging Stations

Hourly Daily
Hourly Pseudo Supplemental

N

Miles
0 5 10 20

Kilometers
0 10 20 40 60

Coordinate system: GCS North American 1983
Scale: 1:1,210,722

Forest City, MN June 21, 1983
Storm Type: MCC

Storm Name:	**Forest City, MN**
Storm Date:	**21-Jun-1983**
AWA Analysis Date:	**12/2/2008**

Storm Adjustment for Nebraska Grid Point 10

Temporal Transposition Date **6-Jul**

	Lat	Long
Storm center location	**45.206 N**	**94.466 W**
Storm Rep dew point location	**44.02 N**	**92.94 W**
Transposition dewpoint location	**40.05 N**	**94.95 W**
Basin location	**41.25 N**	**96.66 W**

Moisture Inflow Direction:	**SE @ 110**	miles
Basin Elevation	**1,300**	feet
Storm Elevation	**1,081**	feet
Storm Duration	**12hr**	feet

The storm representative dew point is	**72.0 F**	with total precipitable water above sea level of			**2.47**	inches.
The in-place maximum dew point is	**82.0 F**	with total precipitable water above sea level of			**3.92**	inches.
The transpositioned maximum dew point is	**81.0 F**	with total precipitable water above sea level of			**3.76**	inches.
The in-place storm elevation is	**1,081**	which subtracts	**0.25**	inches of precipitable water at	**72.0 F**	
The in-place storm elevation is	**1,081**	which subtracts	**0.34**	inches of precipitable water at	**82.0 F**	
The transposition basin elevation at	**1,300**	which subtracts	**0.39**	inches of precipitable water at	**81.0 F**	
The inflow barrier/basin elevation height is	**1,300**	which subtracts	**0.39**	inches of precipitable water at	**81.0 F**	

The in-place storm maximization factor is	**1.50**
The transposition/elevation to basin factor is	**0.94**
The barrier adjustment factor is	**1.00**
The total adjustment factor is	**1.41**

1.61 calculated, but 1.50 used based on HMR 51 and HMR 55A guidance. DAD values taken from SPAS 1035.

Observed Storm Depth-Area-Duration

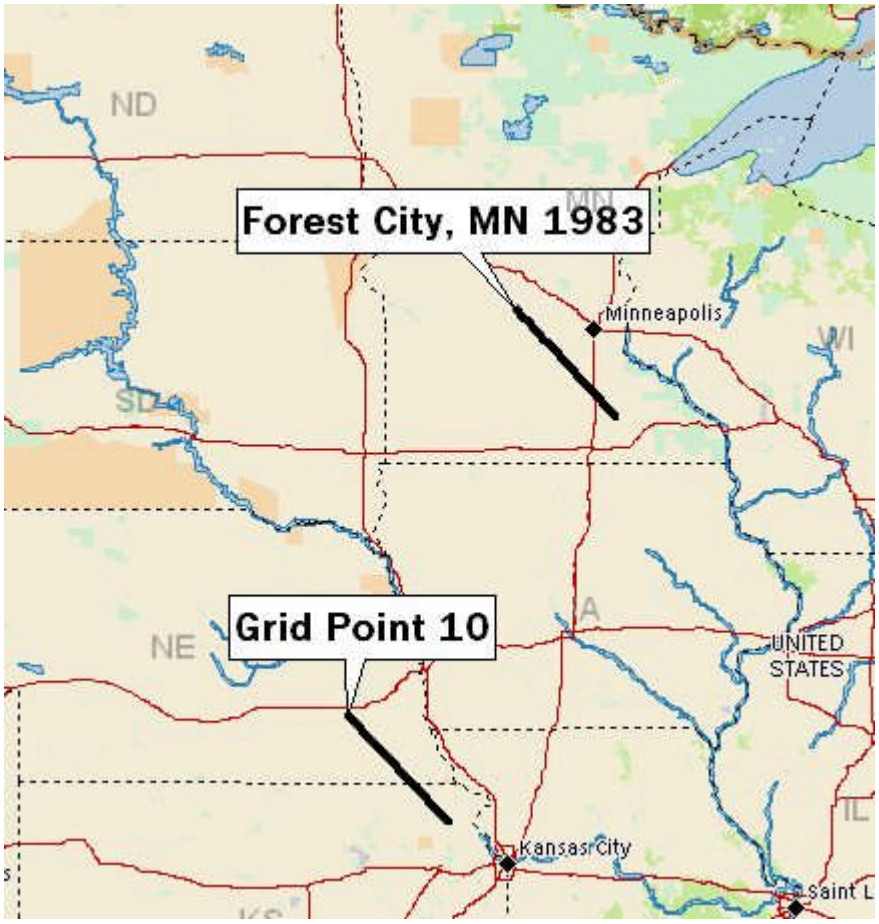
	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**7.7**	**12.7**	**12.7**	**12.7**	**0.0**	**15.3**	**15.3**	**0.0**	**15.3**
100 sq miles	**6.2**	**10.2**	**10.2**	**10.2**	**0.0**	**12.8**	**12.8**	**0.0**	**12.8**
200 sq miles	**5.8**	**9.4**	**9.5**	**9.5**	**0.0**	**12.0**	**12.0**	**0.0**	**12.0**
500 sq miles	**5.0**	**7.9**	**8.0**	**8.0**	**0.0**	**9.9**	**9.9**	**0.0**	**10.0**
1000 sq miles	**4.5**	**6.5**	**6.6**	**6.6**	**0.0**	**7.9**	**7.9**	**0.0**	**7.9**
5000 sq miles	**2.4**	**3.4**	**3.4**	**3.4**	**0.0**	**4.0**	**4.0**	**0.0**	**4.0**
10000 sq miles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
20000 sq miles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Adjusted Storm Depth-Area-Duration

	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**10.9**	**18.0**	**18.0**	**18.0**	**0.0**	**21.7**	**21.7**	**0.0**	**21.7**
100 sq miles	**8.8**	**14.4**	**14.4**	**14.4**	**0.0**	**18.1**	**18.1**	**0.0**	**18.1**
200 sq miles	**8.1**	**13.2**	**13.3**	**13.3**	**0.0**	**16.9**	**16.9**	**0.0**	**16.9**
500 sq miles	**7.1**	**11.2**	**11.3**	**11.3**	**0.0**	**14.0**	**14.0**	**0.0**	**14.1**
1000 sq miles	**6.3**	**9.2**	**9.2**	**9.2**	**0.0**	**11.1**	**11.1**	**0.0**	**11.2**
5000 sq miles	**3.4**	**4.7**	**4.8**	**4.8**	**0.0**	**5.6**	**5.6**	**0.0**	**5.6**
10000 sq miles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
20000 sq miles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Storm or Storm Center Name	**Forest City, MN**	
Storm Date(s)	21-Jun-1983	
Storm Type	MCC-Thunderstorm Complex	
Storm Location	45.206 N	94.466 W
Storm Center Elevation	1,081	
Precipitation Total & Duration	17.00 Inches 12-hours NCDC Storm Data report	
Storm Representative Dewpoint	72.0 F	12hr average Td taken from KRST, MCW, and KMSP 9hr ave from 06-20-83 22Z to 06-21-83 06Z
Storm Representative Dewpoint Location	44.02 N	92.94 W
Maximum Dewpoint	82.0 F	
Moisture Inflow Vector	SE @ 110	
In-place Maximization Factor	1.50	
Temporal Transposition (Date)	6-Jul	
Transposition Dewpoint Location	40.05 N	94.95 W
Transposition Maximum Dewpoint	81.0 F	
Basin Elevation	1,300	
Transposition to Basin Adjustment Factor	0.94	
Higher of Basin Elevation - Inflow Barrier Height	1,300	
Elevation Adjustment Factor	1.00	
Total Adjustment Factor	1.41	

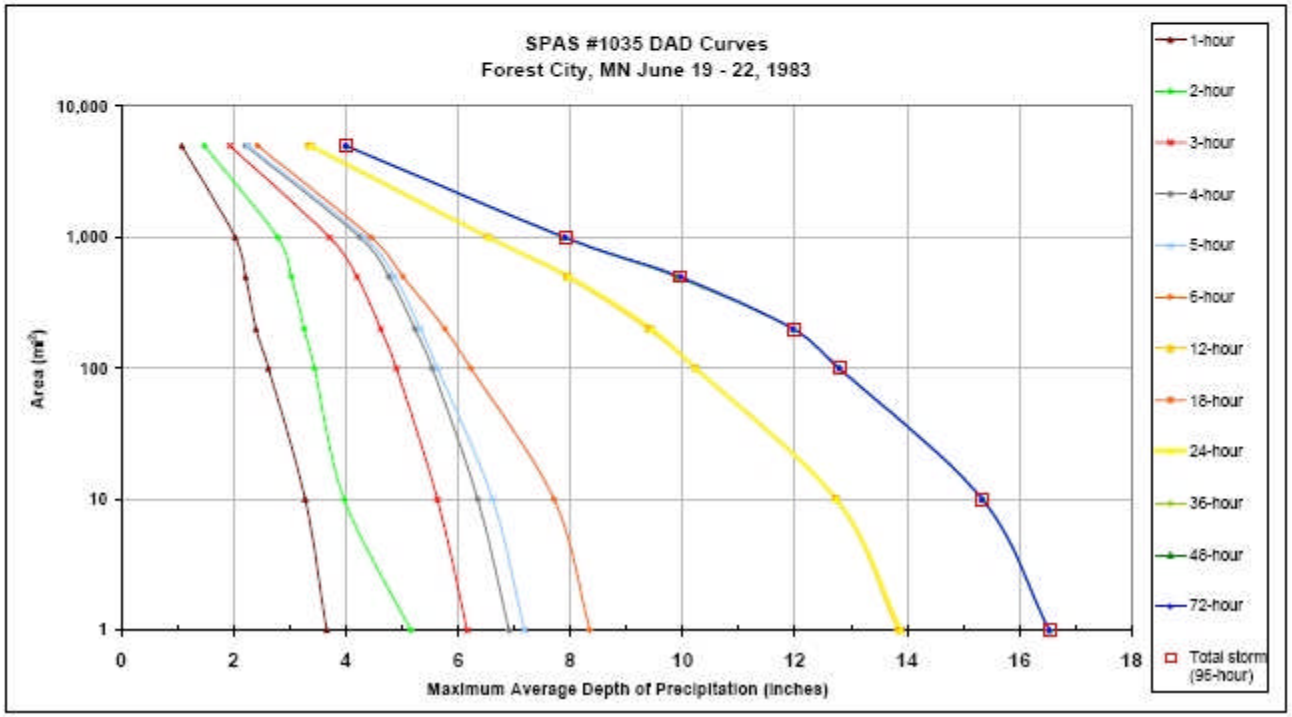
Forest City, MN June 21, 1983 Inflow

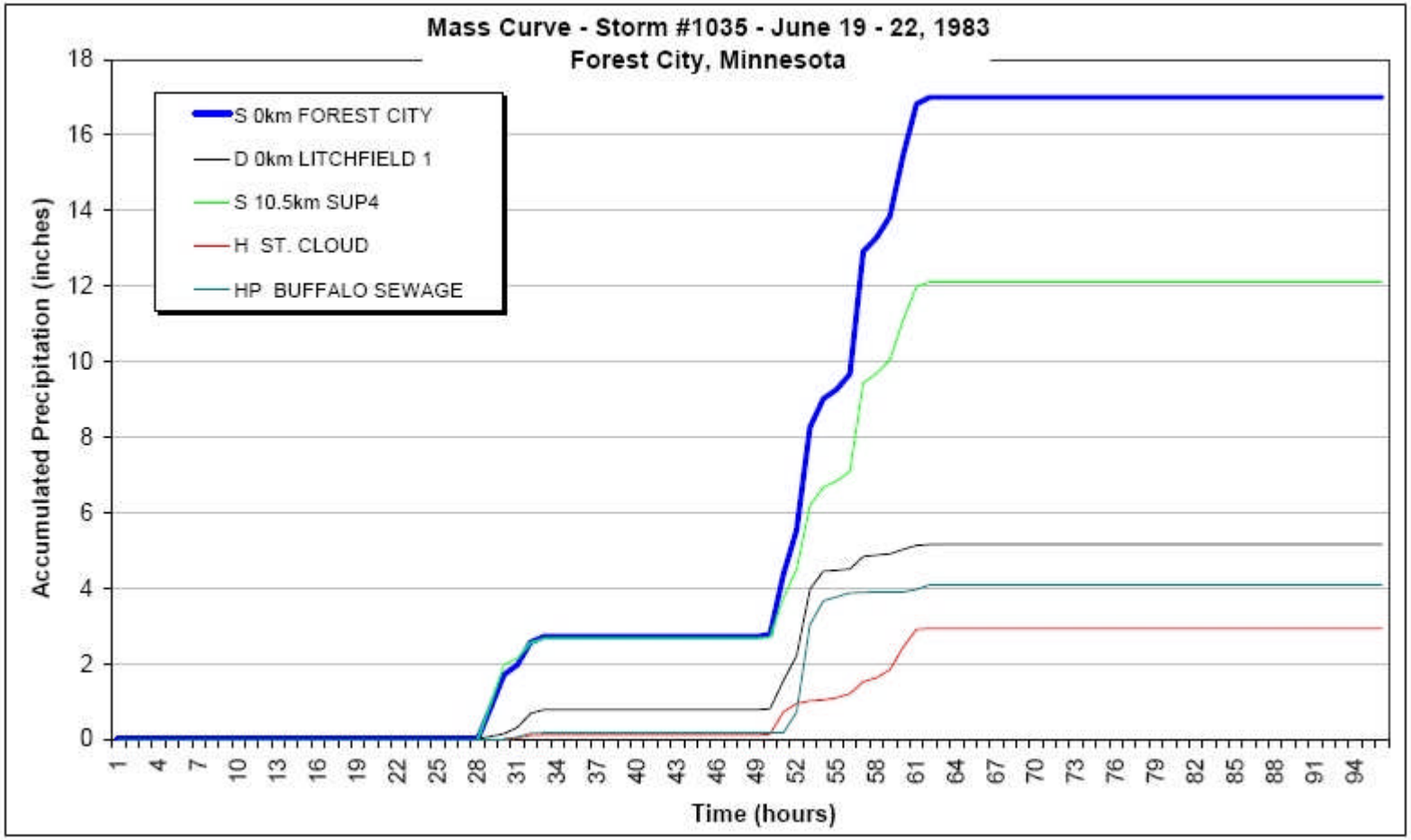


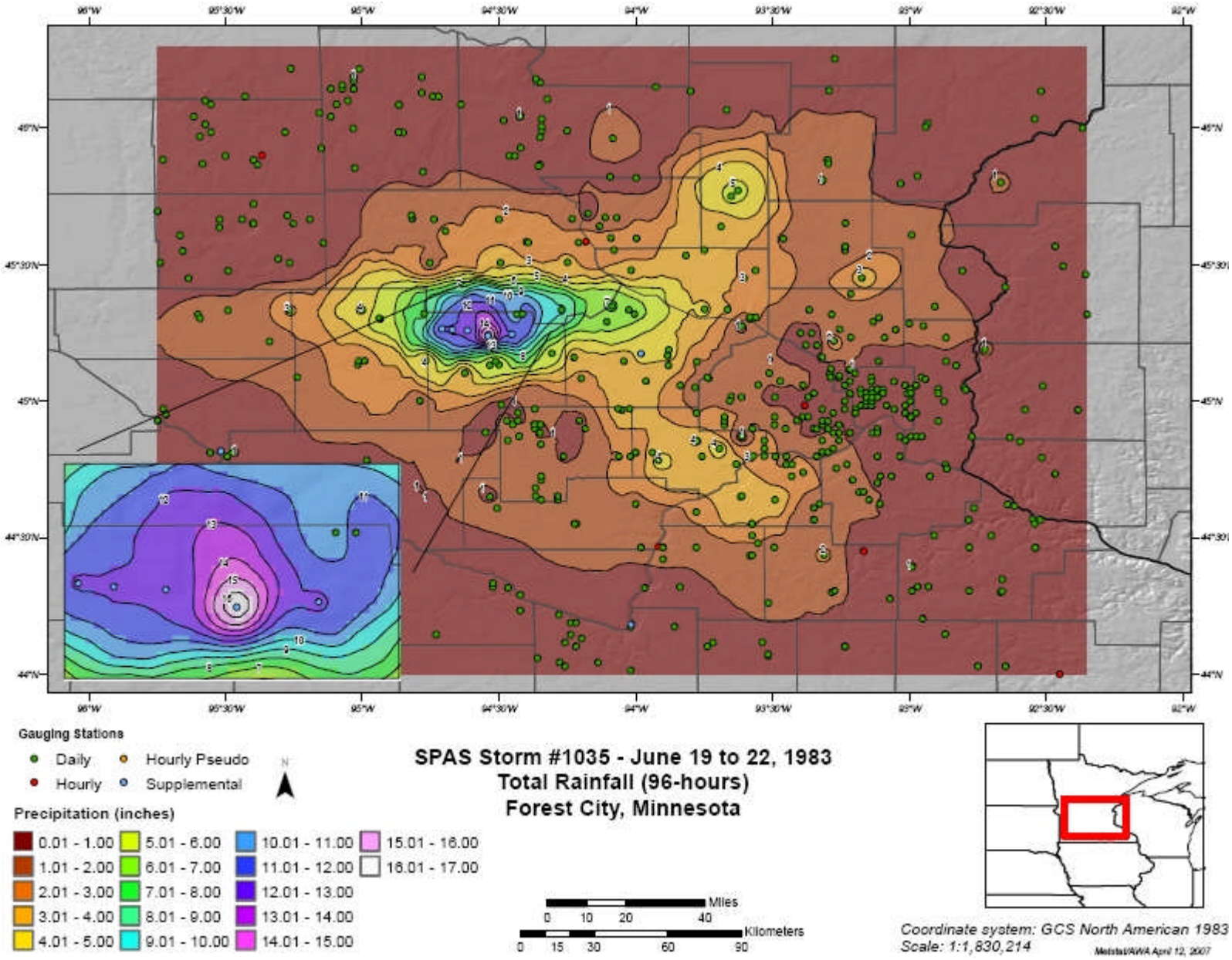
Storm 1035 - Forest City, MN June 19 - 22, 1983

MAXIMUM AVERAGE DEPTH OF PRECIPITATION (INCHES)

Area (mi^2)	Duration (hours)													
	1	2	3	4	5	6	12	18	24	36	48	72	96	total
1	3.66	5.16	6.16	6.91	7.18	8.35	13.64	13.89	13.89	16.53	16.53	16.53	16.53	16.53
10	3.28	3.97	5.63	6.35	6.62	7.71	12.73	12.74	12.74	15.34	15.34	15.34	15.34	15.34
100	2.62	3.44	4.90	5.54	5.63	6.23	10.23	10.23	10.23	12.79	12.79	12.79	12.79	12.79
200	2.40	3.26	4.62	5.23	5.33	5.77	9.36	9.45	9.45	11.97	11.97	11.97	11.97	11.97
500	2.22	3.03	4.20	4.77	4.87	5.02	7.94	7.96	7.96	9.90	9.90	9.97	9.97	9.97
1,000	2.03	2.79	3.71	4.25	4.33	4.45	6.54	6.55	6.55	7.89	7.89	7.91	7.91	7.91
5,000	1.08	1.48	1.94	2.22	2.26	2.43	3.35	3.36	3.36	4.00	4.00	4.00	4.01	4.01




Mass Curve - Storm #1035 - June 19 - 22, 1983
Forest City, Minnesota
S 0km FOREST CITY
D 0km LITCHFIELD 1
S 10.5km SUP4
H ST. CLOUD
HP BUFFALO SEWAGE
Accumulated Precipitation (inches)
Time (hours)
0
2
4
6
8
10
12
14
16
18
1
4
7
10
13
16
19
22
25
28
31
34
37
40
43
46
49
52
55
58
61
64
67
70
73
76
79
82
85
88
91
94


Gauging Stations
Daily
Hourly Pseudo
Hourly
Supplemental
N
Precipitation (inches)
0.01 - 1.00
1.01 - 2.00
2.01 - 3.00
3.01 - 4.00
4.01 - 5.00
5.01 - 6.00
6.01 - 7.00
7.01 - 8.00
8.01 - 9.00
9.01 - 10.00
10.01 - 11.00
11.01 - 12.00
12.01 - 13.00
13.01 - 14.00
14.01 - 15.00
15.01 - 16.00
16.01 - 17.00
SPAS Storm #1035 - June 19 to 22, 1983
Total Rainfall (96-hours)
Forest City, Minnesota
Miles
0 10 20 40
Kilometers
0 15 30 60 90
Coordinate system: GCS North American 1983
Scale: 1:1,830,214
Metstat/AWA April 12, 2007

Grant Township, NE June 3, 1940
Storm Type: MCC

Storm Name:	**Grant Township, NE**
Storm Date:	**03-Jun-1940**
AWA Analysis Date:	**12/2/2008**

Storm Adjustment for Nebraska Grid Point 10

Temporal Transposition Date **18-Jun**

	Lat	Long
Storm center location	**42.24 N**	**96.59 W**
Storm Rep dew point location	**40.51 N**	**96.59 W**
Transposition dewpoint location	**39.02 N**	**97.00 W**
Basin location	**41.25 N**	**96.66 W**

Moisture Inflow Direction:	**S @ 120**	miles
Basin Elevation	**1,300**	feet
Storm Elevation	**1,400**	feet
Storm Duration	**6hr**	feet

The storm representative dew point is	**74.0 F**	with total precipitable water above sea level of			**2.73**	inches.
The in-place maximum dew point is	**82.0 F**	with total precipitable water above sea level of			**3.92**	inches.
The transpositioned maximum dew point is	**82.0 F**	with total precipitable water above sea level of			**3.92**	inches.
The in-place storm elevation is	**1,400**	which subtracts	**0.34**	inches of precipitable water at	**74.0 F**	
The in-place storm elevation is	**1,400**	which subtracts	**0.44**	inches of precipitable water at	**82.0 F**	
The transposition basin elevation at	**1,300**	which subtracts	**0.4**	inches of precipitable water at	**82.0 F**	
The inflow barrier/basin elevation height is	**1,300**	which subtracts	**0.4**	inches of precipitable water at	**82.0 F**	

The in-place storm maximization factor is	**1.46**
The transposition/elevation to basin factor is	**1.01**
The barrier adjustment factor is	**1.00**
The total adjustment factor is	**1.47**

Notes: DAD values taken from USACE Storm Studies MR 4-5

Observed Storm Depth-Area-Duration

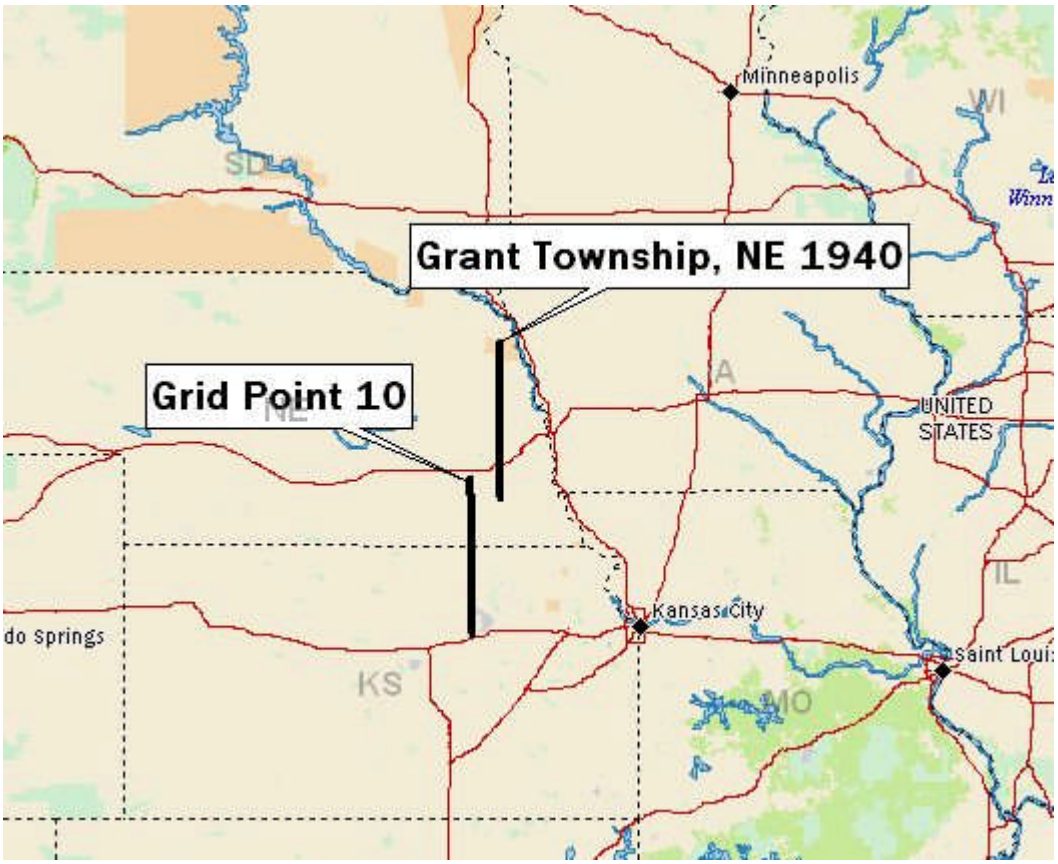
	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**13.0**	**13.0**	**13.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
100 sq miles	**10.6**	**11.7**	**11.7**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
200 sq miles	**9.6**	**11.2**	**11.2**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
500 sq miles	**8.3**	**10.2**	**10.3**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
1000 sq miles	**7.2**	**8.9**	**9.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
5000 sq miles	**4.2**	**5.5**	**5.7**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
10000 sq miles	**3.1**	**4.4**	**4.6**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
20000 sq miles	**2.1**	**3.3**	**3.5**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Adjusted Storm Depth-Area-Duration

	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**19.1**	**19.1**	**19.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
100 sq miles	**15.6**	**17.2**	**17.2**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
200 sq miles	**14.1**	**16.5**	**16.5**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
500 sq miles	**12.2**	**15.0**	**15.2**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
1000 sq miles	**10.6**	**13.1**	**13.3**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
5000 sq miles	**6.2**	**8.1**	**8.4**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
10000 sq miles	**4.6**	**6.5**	**6.8**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
20000 sq miles	**3.1**	**4.9**	**5.2**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

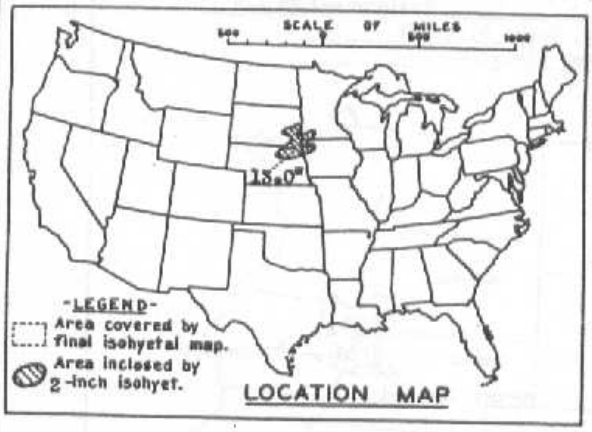
Storm or Storm Center Name	**Grant Township, NE**
Storm Date(s)	3-Jun-1940
Storm Type	MCC
Storm Location	42.24 N 96.59 W
Storm Center Elevation	1,400
Precipitation Total & Duration	13.00 Inches 6-hours USACE Storm Studies MR 4-5
Storm Representative Dewpoint	74.0 F 6hr average, 7° add to storm rep USACE Td based on EPRI and Wanahoo guidance
Storm Representative Dewpoint Location	40.51 N 96.59 W
Maximum Dewpoint	82.0 F
Moisture Inflow Vector	S @ 120 Miles
In-place Maximization Factor	1.46
Temporal Transposition (Date)	18-Jun
Transposition Dewpoint Location	39.02 N 97.00 W
Transposition Maximum Dewpoint	82.0 F
Basin Elevation	1,300
Transposition to Basin Adjustment Factor	1.01
Higher of Basin Elevation - Inflow Barrier Height	1,300
Elevation Adjustment Factor	1.00
Total Adjustment Factor	1.47

Grant Township, NE June 3, 1940 Inflow



DEPARTMENT OF THE ARMY — CORPS OF ENGINEERS

STORM STUDIES – PERTINENT DATA SHEET



LOCATION MAP

Storm of 3-4 June 1940
Assignment MR 4-5
Location Nebr., Ia., Minn.
Study Prepared by:
Missouri River Division
Omaha District Office

Part I Reviewed by H. M. Sec. of Weather Bureau, 11/15/50
Part II Approved by Office, Chief of Engineers for Distribution of Factual Data, 12/11/52
Remarks: Center at Grant Township, Nebr. Dewpt. 63°F - Ref. Pt. 120 S. Grid D-15

DATA AND COMPUTATIONS COMPILED

PART I

Preliminary isohyetal map, in 1 sheet, scale 1: 1,000,000

Precipitation data and mass curves:

	(Number of Sheets)
Form 5001-C (Hourly precip. data)	9
Form 5001-B (24-hour " ")	-
Form 5001-D (" " " ")	8
Misc. precip. records, meteorological data, etc.	12
Form 5002 (Mass rainfall curves)	24

PART II

Final isohyetal maps, in 1 sheet, scale 1: 1,000,000

Data and computation sheets:

Form S-10 (Data from mass rainfall curves)	3
Form S-11 (Depth-area data from isohyetal map)	1
Form S-12 (Maximum depth-duration data)	7
Maximum duration-depth-area curves	1
Data relating to periods of maximum rainfall	7

MAXIMUM AVERAGE DEPTH OF RAINFALL IN INCHES

Area in Sq. Mi.	Duration of Rainfall in Hours										
	3	6	9	12	15	18	20				
10	8.3	13.0	13.0	13.0	13.0	13.0	13.0				
100	6.4	10.6	11.7	11.7	11.7	11.7	11.7				
200	5.5	9.6	11.1	11.2	11.2	11.2	11.2				
500	4.5	8.3	10.0	10.2	10.3	10.3	10.3				
1,000	3.8	7.2	8.8	8.9	9.0	9.0	9.0				
2,000	3.2	6.0	7.3	7.5	7.6	7.6	7.6				
5,000	2.4	4.2	5.3	5.5	5.7	5.7	5.7				
10,000	1.8	3.1	4.0	4.4	4.6	4.6	4.6				
20,000	1.2	2.1	2.8	3.3	3.5	3.5	3.5				

Form S-2

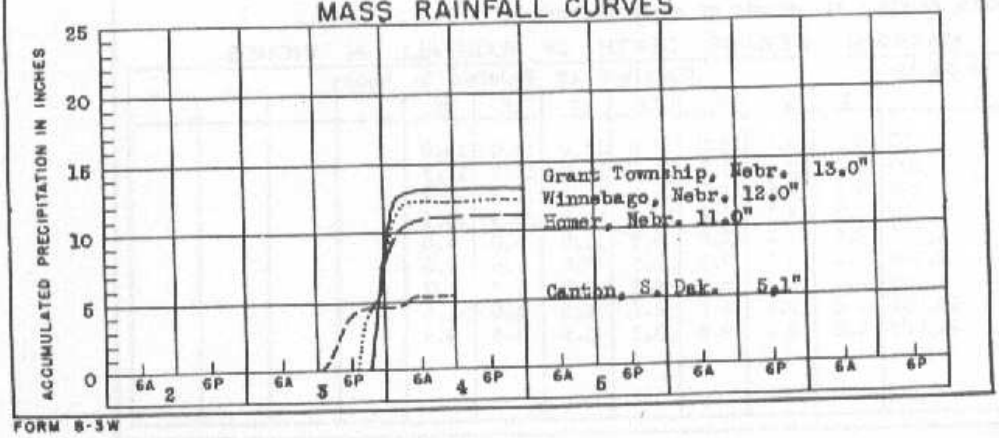
DEPARTMENT OF THE ARMY — CORPS OF ENGINEERS

STORM STUDIES – ISOHYETAL MAP

Storm of 3-4 June 1940 — Assignment MR 4-5

Study Prepared by: Omaha, Nebr. District
Missouri River Division

MASS RAINFALL CURVES



FORM 8-3W

Greeley, NE June 4, 1896
Storm Type: MCC

Storm Name:	**Greeley, NE**
Storm Date:	**6/4/1896**
AWA Analysis Date:	**12/2/2008**

Storm Adjustment for Nebraska Grid Point 10

Temporal Transposition Date **19-Jun**

	Lat	Long
Storm center location	**41.55 N**	**98.53 W**
Storm Rep dew point location	**39.61 N**	**97.49 W**
Transposition dewpoint location	**38.81 N**	**95.96 W**
Basin location	**41.25 N**	**96.66 W**

Moisture Inflow Direction:	**SSE @ 145**	miles
Basin Elevation	**1,300**	feet
Storm Elevation	**2,000**	feet
Storm Duration	**6hr**	feet

The storm representative dew point is	**76.0 F**	with total precipitable water above sea level of			**2.99**	inches.
The in-place maximum dew point is	**82.0 F**	with total precipitable water above sea level of			**3.92**	inches.
The transpositioned maximum dew point is	**82.0 F**	with total precipitable water above sea level of			**3.92**	inches.
The in-place storm elevation is	**2,000**	which subtracts	**0.5**	inches of precipitable water at	**76.0 F**	
The in-place storm elevation is	**2,000**	which subtracts	**0.61**	inches of precipitable water at	**82.0 F**	
The transposition basin elevation at	**1,300**	which subtracts	**0.4**	inches of precipitable water at	**82.0 F**	
The inflow barrier/basin elevation height is	**1,300**	which subtracts	**0.4**	inches of precipitable water at	**82.0 F**	

The in-place storm maximization factor is	**1.33**
The transposition/elevation to basin factor is	**1.06**
The barrier adjustment factor is	**1.00**
The total adjustment factor is	**1.41**

Notes: DAD values taken from USACE MR 4-3

Observed Storm Depth-Area-Duration

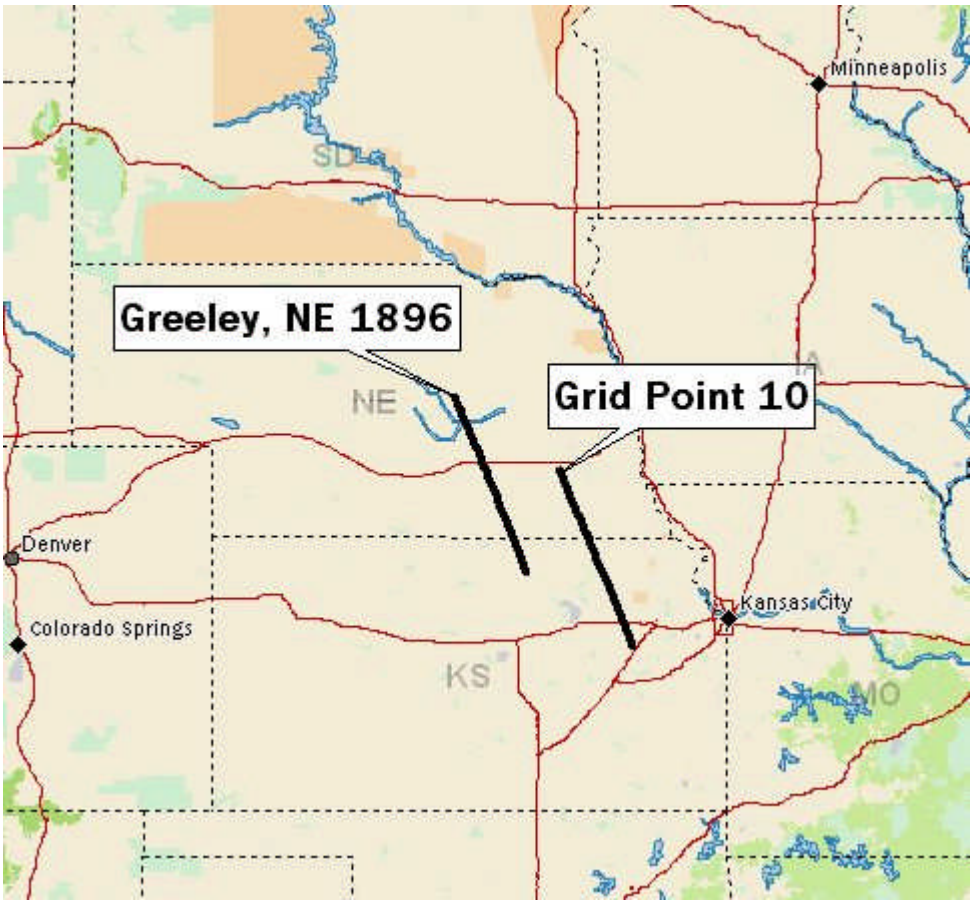
	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**12.0**	**12.0**	**12.2**	**12.3**	**12.3**	**12.3**	**12.3**	**12.3**	**12.3**
100 sq miles	**11.6**	**11.6**	**11.6**	**11.8**	**11.8**	**11.8**	**11.8**	**11.8**	**11.8**
200 sq miles	**11.2**	**11.2**	**11.2**	**11.5**	**11.5**	**11.5**	**11.5**	**11.5**	**11.5**
500 sq miles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
1000 sq miles	**8.7**	**8.9**	**9.0**	**9.2**	**9.4**	**9.4**	**9.4**	**9.4**	**9.4**
5000 sq miles	**4.0**	**4.3**	**4.9**	**5.1**	**5.2**	**5.3**	**5.3**	**5.3**	**5.3**
10000 sq miles	**2.4**	**2.8**	**3.7**	**4.0**	**4.1**	**4.2**	**4.2**	**4.4**	**4.5**
20000 sq miles	**1.3**	**1.8**	**2.6**	**3.0**	**3.1**	**3.2**	**3.2**	**3.7**	**3.8**

Adjusted Storm Depth-Area-Duration

	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**17.0**	**17.0**	**17.2**	**17.4**	**17.4**	**17.4**	**17.4**	**17.4**	**17.4**
100 sq miles	**16.4**	**16.4**	**16.4**	**16.7**	**16.7**	**16.7**	**16.7**	**16.7**	**16.7**
200 sq miles	**15.8**	**15.8**	**15.8**	**16.3**	**16.3**	**16.3**	**16.3**	**16.3**	**16.3**
500 sq miles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
1000 sq miles	**12.3**	**12.6**	**12.7**	**13.0**	**13.3**	**13.3**	**13.3**	**13.3**	**13.3**
5000 sq miles	**5.7**	**6.1**	**6.9**	**7.2**	**7.4**	**7.5**	**7.5**	**7.5**	**7.5**
10000 sq miles	**3.4**	**4.0**	**5.2**	**5.7**	**5.8**	**5.9**	**5.9**	**6.2**	**6.4**
20000 sq miles	**1.8**	**2.5**	**3.7**	**4.2**	**4.4**	**4.5**	**4.5**	**5.2**	**5.4**

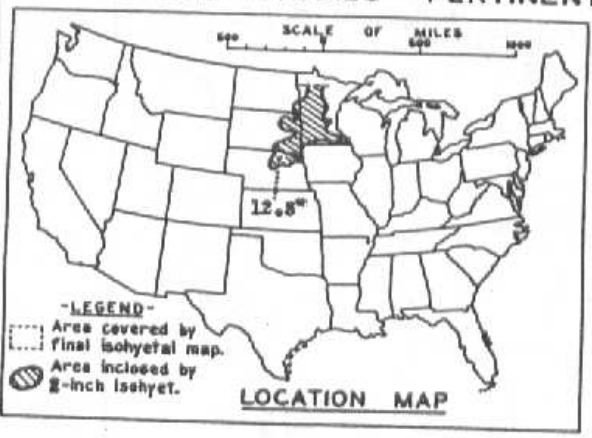
Storm or Storm Center Name	**Greeley, NE**
Storm Date(s)	6/4/1896
Storm Type	MCC
Storm Location	41.55 N 98.53 W
Storm Center Elevation	2,000
Precipitation Total & Duration	12.30 Inches 24-hours USACE MR 4-3
Storm Representative Dewpoint	76.0 F 6hr average, 7° added to USACE storm rep Td based on EPRI and Wanahoo guidance
Storm Representative Dewpoint Location	39.61 N 97.49 W
Maximum Dewpoint	82.0 F
Moisture Inflow Vector	SSE @ 145 Miles
In-place Maximization Factor	1.33
Temporal Transposition (Date)	19-Jun
Transposition Dewpoint Location	38.81 N 95.96 W
Transposition Maximum Dewpoint	82.0 F
Basin Elevation	1,300
Transposition to Basin Adjustment Factor	1.06
Higher of Basin Elevation - Inflow Barrier Height	1,300
Elevation Adjustment Factor	1.00
Total Adjustment Factor	1.41

Greeley, NE June 4, 1896 Inflow



DEPARTMENT OF THE ARMY — CORPS OF ENGINEERS

STORM STUDIES - PERTINENT DATA SHEET



LOCATION MAP

Storm of 4-7 June 1896
Assignment MR 4-3
Location Nebr., S.D. Minn.
Study Prepared by:
Missouri River Division
Omaha District Office

Part I Reviewed by H. M. Sec. of Weather Bureau, 8/11/49
Part II Approved by Office, Chief of Engineers for Distribution of Factual Data, 2/9/51
Remarks: Center at Greeley, Nebr. Dewpt. 69°-Ref. Pt. 145 SE Grid D-16

DATA AND COMPUTATIONS COMPILED

PART I

Preliminary isohyetal map, in 1 sheet, scale 1: 2,500,000

Precipitation data and mass curves: (Number of Sheets)

Form 5001-C (Hourly precip. data)	8
Form 5001-B (24-hour " ")	-
Form 5001-D (" " " ")	10
Misc. precip. records, meteorological data, etc.	9
Form 5002 (Mass rainfall curves)	24

PART II

Final isohyetal maps, in 1 sheet, scale 1: 1,000,000

Data and computation sheets:

Form S-10 (Data from mass rainfall curves)	3
Form S-11 (Depth-area data from isohyetal map)	2
Form S-12 (Maximum depth-duration data)	13
Maximum duration-depth-area curves	1
Data relating to periods of maximum rainfall	7

MAXIMUM AVERAGE DEPTH OF RAINFALL IN INCHES

Area in Sq. Mi.	Duration of Rainfall in Hours										
	6	12	18	24	30	36	48	60	72	78	
10	12.0	12.0	12.2	12.3	12.3	12.3	12.3	12.3	12.3	12.3	
100	11.6	11.6	11.6	11.8	11.8	11.8	11.8	11.8	11.8	11.8	
200	11.2	11.2	11.2	11.5	11.5	11.5	11.5	11.5	11.5	11.5	
500	10.2	10.2	10.2	10.6	10.6	10.6	10.6	10.6	10.6	10.6	
1,000	8.7	8.9	9.0	9.2	9.4	9.4	9.4	9.4	9.4	9.4	
2,000	6.6	6.9	7.0	7.2	7.5	7.5	7.5	7.5	7.5	7.5	
5,000	4.0	4.3	4.9	5.1	5.2	5.3	5.3	5.3	5.3	5.3	
10,000	2.4	2.8	3.7	4.0	4.1	4.2	4.2	4.4	4.5	4.5	
20,000	1.3	1.8	2.6	3.0	3.1	3.2	3.2	3.7	3.8	3.8	
50,000	0.6	1.1	1.7	2.1	2.3	2.4	2.5	3.1	3.3	3.3	
84,000	0.5	1.0	1.4	1.8	2.2	2.3	2.4	3.0	3.2	3.2	

Form S-2

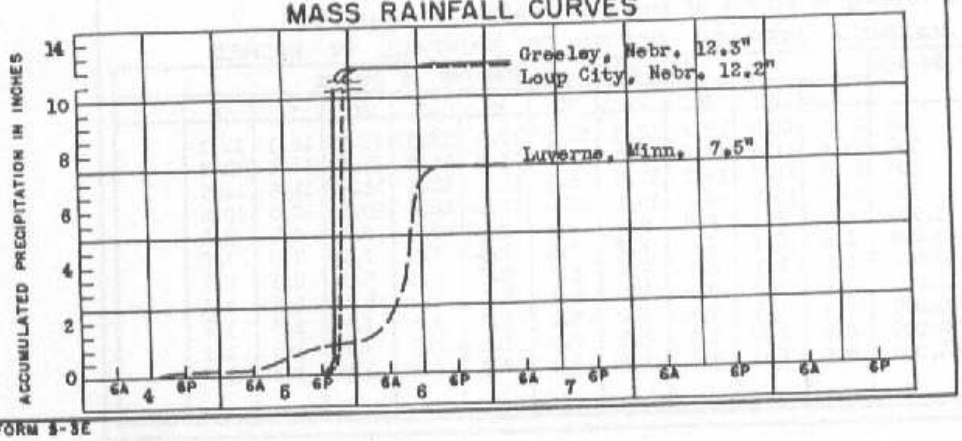
DEPARTMENT OF THE ARMY — CORPS OF ENGINEERS

STORM STUDIES - ISOHYETAL MAP

Storm of 4-7 June 1896 — Assignment MR 4-3

Study Prepared by: Omaha, Nebr. District
Missouri River Division

MASS RAINFALL CURVES



FORM 1-3E

Hale, CO May 31, 1935
Storm Type: MCC

Storm Name:	**Hale, CO**
Storm Date:	**30-May-1935**
AWA Analysis Date:	**12/2/2008**

Storm Adjustment for Nebraska Grid Point 14

Temporal Transposition Date **31-May**

	Lat	Long
Storm center location	**39.61 N**	**102.25 W**
Storm Rep dew point location	**35.88 N**	**100.22 W**
Transposition dewpoint location	**38.52 N**	**98.97 W**
Basin location	**41.25 N**	**96.66 W**

Moisture Inflow Direction:	**SSE @ 280**	miles
Basin Elevation	**1,300**	feet
Storm Elevation	**3,856**	feet
Storm Duration	**12hr**	feet

The storm representative dew point is	**77.0 F**	with total precipitable water above sea level of			**3.14**	inches.
The in-place maximum dew point is	**77.0 F**	with total precipitable water above sea level of			**3.14**	inches.
The transpositioned maximum dew point is	**76.5 F**	with total precipitable water above sea level of			**3.07**	inches.
The in-place storm elevation is	**3,856**	which subtracts	**0.935**	inches of precipitable water at	**77.0 F**	
The in-place storm elevation is	**3,856**	which subtracts	**0.89**	inches of precipitable water at	**77.0 F**	
The transposition basin elevation at	**1,300**	which subtracts	**0.335**	inches of precipitable water at	**76.5 F**	
The inflow barrier/basin elevation height is	**1,300**	which subtracts	**0.335**	inches of precipitable water at	**76.5 F**	

The in-place storm maximization factor is	**1.00**
The transposition/elevation to basin factor is	**1.22**
The barrier adjustment factor is	**1.00**
The total adjustment factor is	**1.22**

Observed Storm Depth-Area-Duration

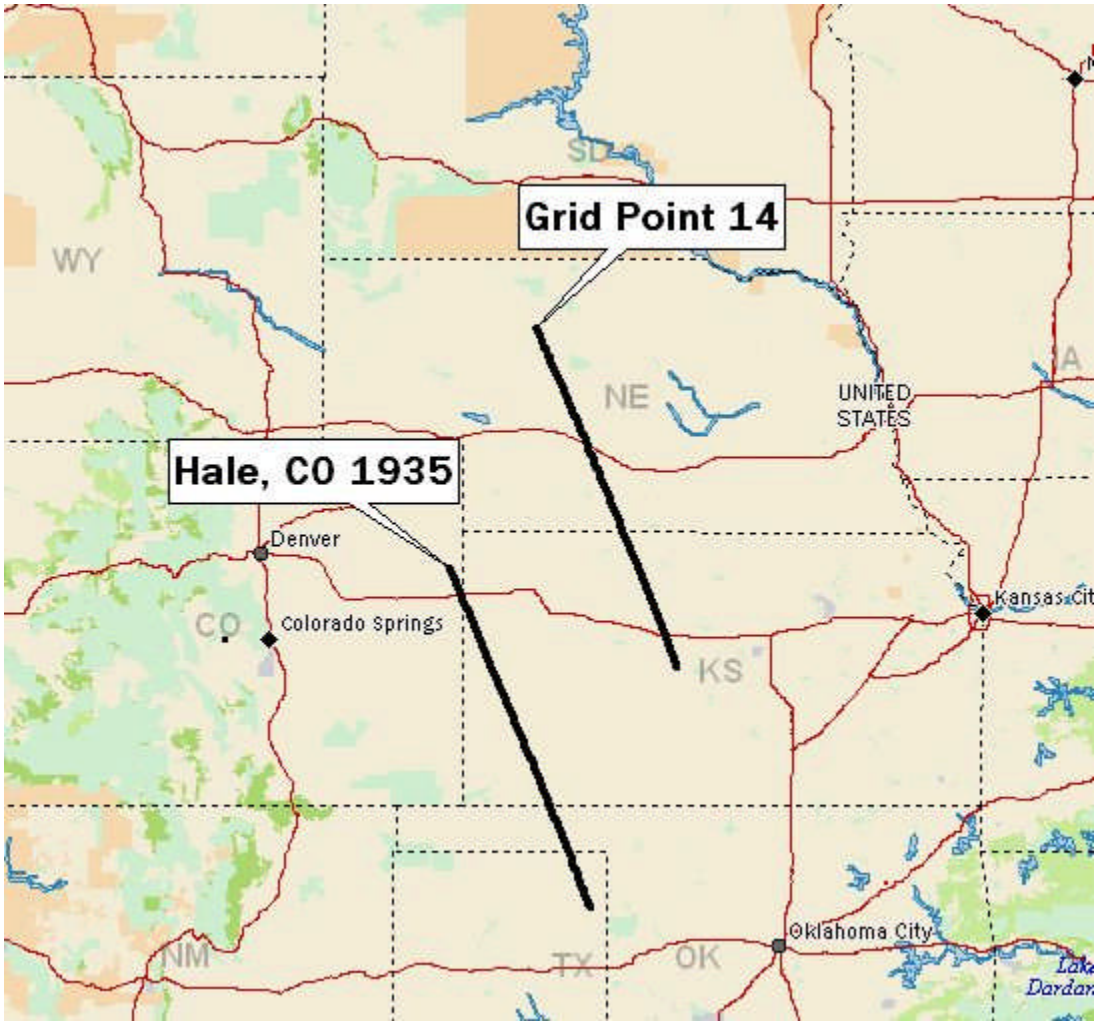
	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**15.6**	**15.7**	**15.6**	**15.6**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
100 sq miles	**13.3**	**13.4**	**13.4**	**13.4**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
200 sq miles	**11.9**	**12.1**	**12.1**	**12.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
500 sq miles	**10.0**	**10.2**	**10.2**	**10.2**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
1000 sq miles	**8.7**	**8.8**	**8.8**	**8.8**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
5000 sq miles	**5.2**	**5.8**	**5.8**	**5.8**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
10000 sq miles	**3.7**	**4.6**	**4.6**	**4.6**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
20000 sq miles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Adjusted Storm Depth-Area-Duration

	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**19.0**	**19.0**	**18.9**	**18.9**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
100 sq miles	**16.1**	**16.2**	**16.2**	**16.2**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
200 sq miles	**14.5**	**14.7**	**14.7**	**14.7**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
500 sq miles	**12.1**	**12.4**	**12.4**	**12.4**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
1000 sq miles	**10.5**	**10.7**	**10.7**	**10.7**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
5000 sq miles	**6.3**	**7.1**	**7.1**	**7.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
10000 sq miles	**4.5**	**5.5**	**5.6**	**5.6**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
20000 sq miles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Storm or Storm Center Name	**Hale, CO**	
Storm Date(s)	30-May-1935	
Storm Type	MCC-Thunderstorms	
Storm Location	39.61 N	102.25 W
Storm Center Elevation	3,856	Based on storm center max isohyetal location
Precipitation Total & Duration	18.00" used as stomr maximum based on new analys	
Storm Representative Dewpoint	77.0 F	12hr average added 7°F to Td as accepted by EPRI Michigan Wisconsin and Wanahoo studies
Storm Representative Dewpoint Location	35.88 N	100.22 W
Maximum Dewpoint	77.0 F	
Moisture Inflow Vector	SSE @ 280 Miles	
In-place Maximization Factor	1.00	
Temporal Transposition (Date)	31-May	
Transposition Dewpoint Location	38.52 N	98.97 W
Transposition Maximum Dewpoint	76.5 F	
Basin Elevation	1,300	
Transposition to Basin Adjustment Factor	1.22	
Higher of Basin Elevation - Inflow Barrier Height	1,300	
Elevation Adjustment Factor	1.00	
Total Adjustment Factor	1.22	

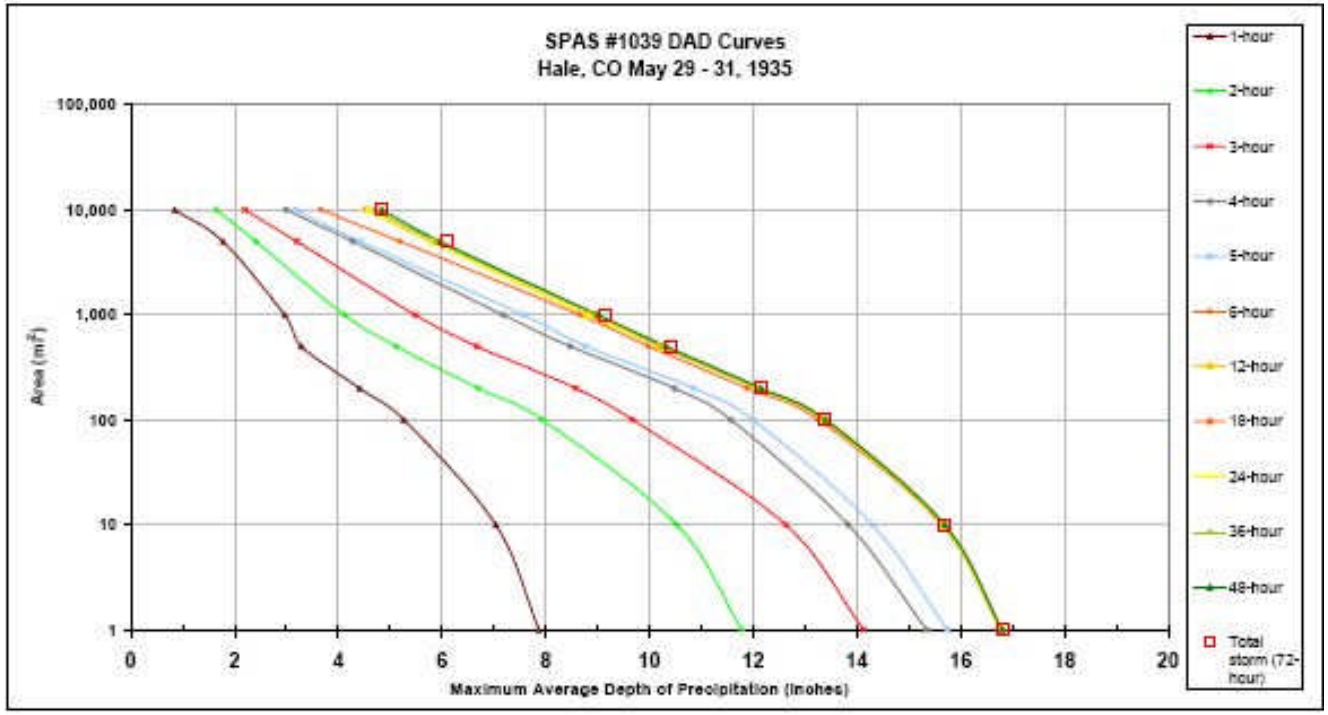
Hale, CO May 31, 1935 Inflow

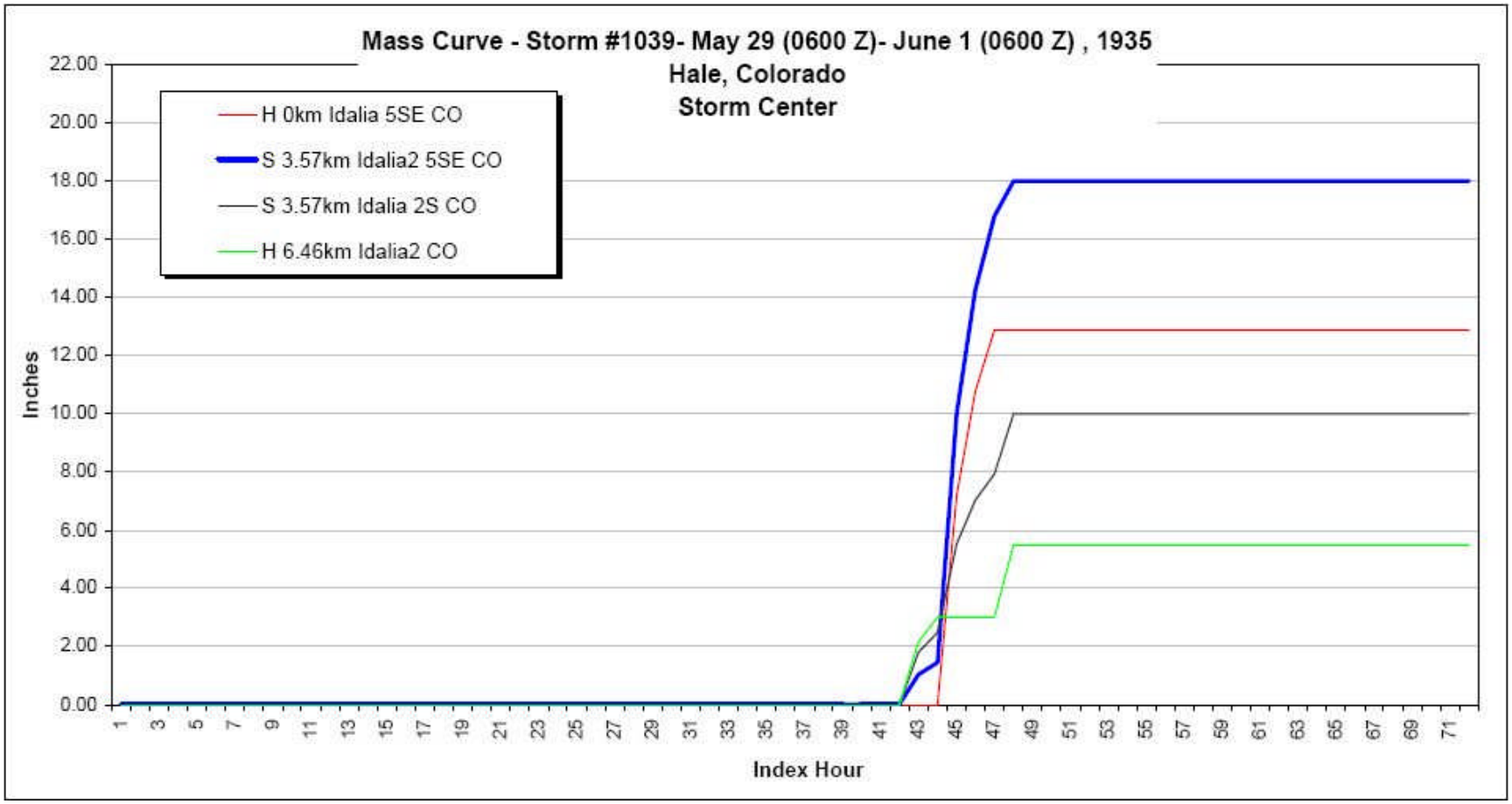


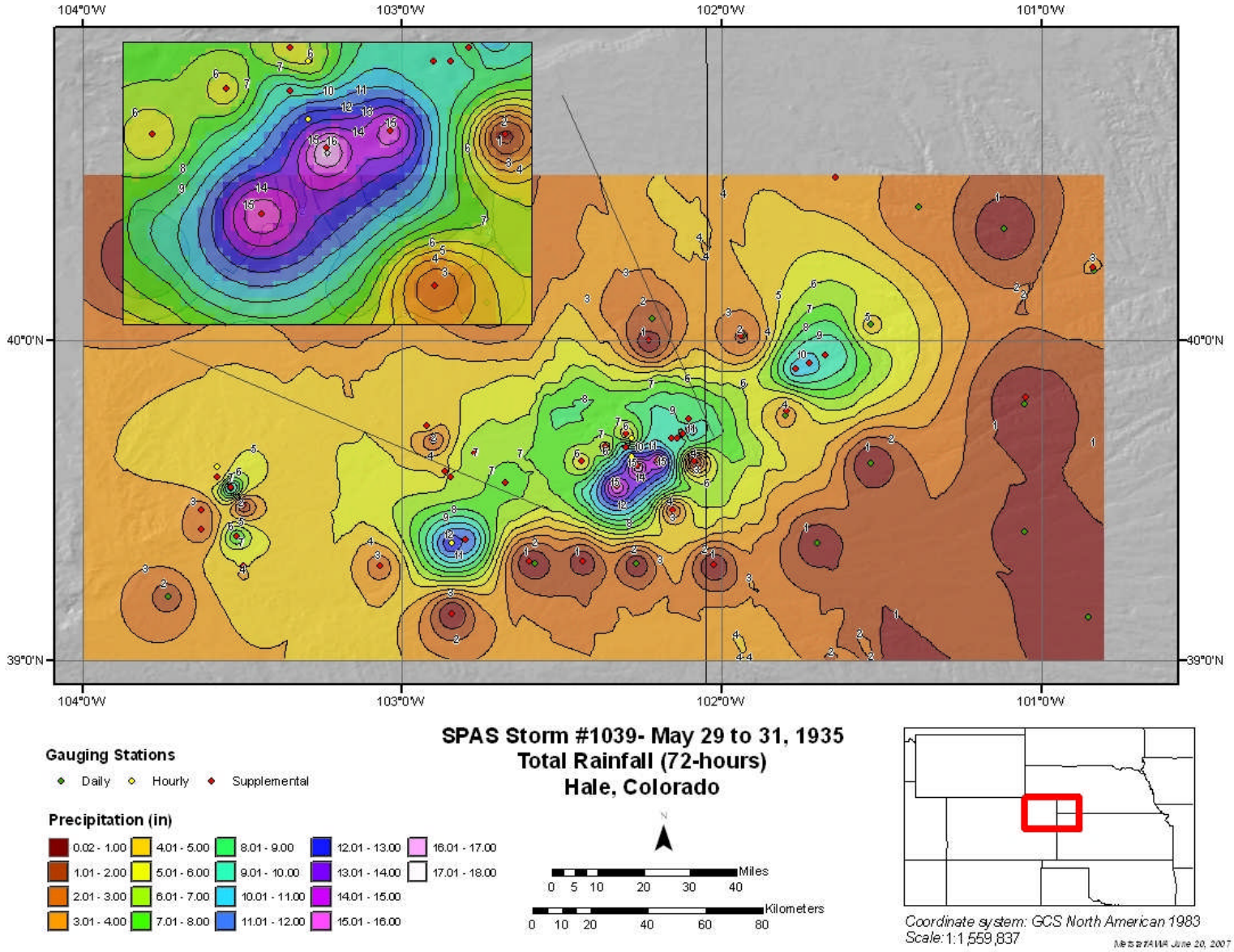
Storm 1039 - Hale, CO May 29 - 31, 1935

MAXIMUM AVERAGE DEPTH OF PRECIPITATION (INCHES)

Area (mi^2)	Duration (hours)												
	1	2	3	4	5	6	12	18	24	36	48	72	total
0.26	7.99	12.09	14.49	15.71	15.93	17.14	17.16	17.16	17.16	17.16	17.17	17.17	17.17
1	7.87	11.78	14.13	15.34	15.74	16.78	16.79	16.79	16.79	16.80	16.80	16.80	16.80
10	7.04	10.53	12.63	13.83	14.30	15.64	15.66	15.66	15.66	15.68	15.69	15.70	15.70
100	5.26	7.93	9.67	11.57	11.99	13.25	13.36	13.36	13.36	13.38	13.39	13.39	13.39
200	4.41	6.70	8.58	10.48	10.95	11.89	12.09	12.09	12.09	12.12	12.15	12.16	12.16
500	3.29	5.12	6.67	8.47	8.77	9.98	10.20	10.20	10.21	10.23	10.32	10.43	10.43
1,000	2.97	4.12	5.49	7.18	7.57	8.66	8.81	8.81	8.81	9.00	9.00	9.14	9.14
5,000	1.78	2.42	3.20	4.28	4.42	5.19	5.81	5.81	5.81	5.88	5.97	6.09	6.09
10,000	0.85	1.55	2.20	2.99	3.18	3.67	4.56	4.56	4.57	4.71	4.84	4.84	4.84

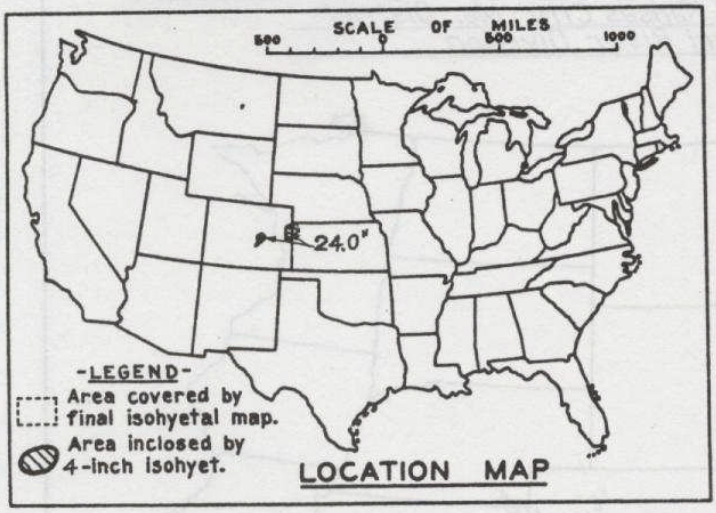



Mass Curve - Storm #1039- May 29 (0600 Z)- June 1 (0600 Z) , 1935
Hale, Colorado
Storm Center
H 0km Idalia 5SE CO
S 3.57km Idalia2 5SE CO
S 3.57km Idalia 2S CO
H 6.46km Idalia2 CO
Inches
22.00
20.00
18.00
16.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49 51 53 55 57 59 61 63 65 67 69 71
Index Hour


104°0'W
103°0'W
102°0'W
101°0'W
40°0'N
39°0'N
SPAS Storm #1039- May 29 to 31, 1935
Total Rainfall (72-hours)
Hale, Colorado
Gauging Stations
Daily
Hourly
Supplemental
Precipitation (in)
0.02 - 1.00
1.01 - 2.00
2.01 - 3.00
3.01 - 4.00
4.01 - 5.00
5.01 - 6.00
6.01 - 7.00
7.01 - 8.00
8.01 - 9.00
9.01 - 10.00
10.01 - 11.00
11.01 - 12.00
12.01 - 13.00
13.01 - 14.00
14.01 - 15.00
15.01 - 16.00
16.01 - 17.00
17.01 - 18.00
N
Miles
0 5 10 20 30 40
Kilometers
0 10 20 40 60 80
Coordinate system: GCS North American 1983
Scale: 1:1,559,837

WAR DEPARTMENT — CORPS OF ENGINEERS, U. S. ARMY

STORM STUDIES - PERTINENT DATA SHEET



LOCATION MAP

Storm of May 30 - 31, 1935
Assignment M R 3 - 28 A
Location Eastern Colorado
Study Prepared by:
Missouri River Division
Kansas City District

Part I Reviewed by H. M. Sec. of Weather Bureau, 11/16/42
Part II Approved by Office, Chief of Engineers for Distribution of Factual Data, 7/14/45
Remarks: Centers: N.E. of Colorado Springs, Colo. and N.E. of Burlington, Colo.

DATA AND COMPUTATIONS COMPILED

PART I

Preliminary isohyetal map, in 1 sheet, scale 1 : 1,000,000

Precipitation data and mass curves: (Number of Sheets)

Form 5001-C (Hourly precip. data)	29
Form 5001-B (24-hour " ")	64
Form 5001-D (" " " ")	3
Miscl. precip. records, meteorological data, etc.	37
Form 5002 (Mass rainfall curves)	63

PART II

Final isohyetal maps, in 2 sheet, scale 1 : 1,000,000 & 1 : 500,000

Data and computation sheets:

Form S-10 (Data from mass rainfall curves)	3
Form S-11 (Depth-area data from isohyetal map)	2
Form S-12 (Maximum depth-duration data)	7
Maximum duration-depth-area curves	1
Data relating to periods of maximum rainfall	2

MAXIMUM AVERAGE DEPTH OF RAINFALL IN INCHES

Area in Sq. Mi.	Duration of Rainfall in Hours										
	6	12	18	24							
Max. Station	24.0	24.0	24.0	24.0							
5	22.1	23.3	23.3	23.3							
10	20.6	22.2	22.2	22.2							
20	18.8	20.7	20.7	20.7							
50	16.0	18.0	18.0	18.0							
100	13.7	15.4	15.4	15.4							
200	11.2	12.6	12.6	12.6							
500	7.8	9.3	9.3	9.3							
1,000	5.8	7.2	7.2	7.2							
2,000	4.1	5.3	5.5	5.5							
5,000	2.4	3.5	3.8	4.0							
6,300	2.1	3.1	3.6	3.8							

Form S-2

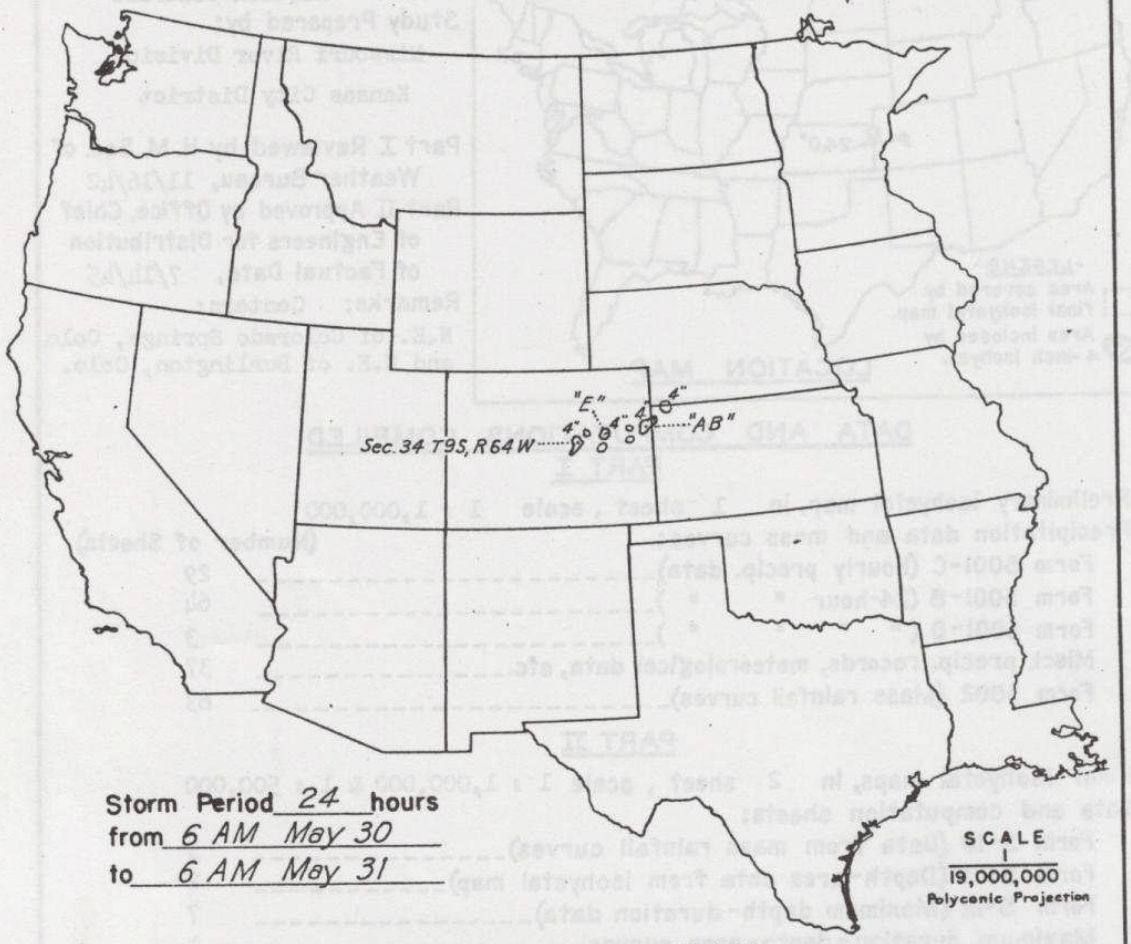
WAR DEPARTMENT

CORPS OF ENGINEERS, U. S. ARMY

STORM STUDIES – ISOHYETAL MAP

Storm of May 30-31, 1935 Assignment MR-3-28(A)

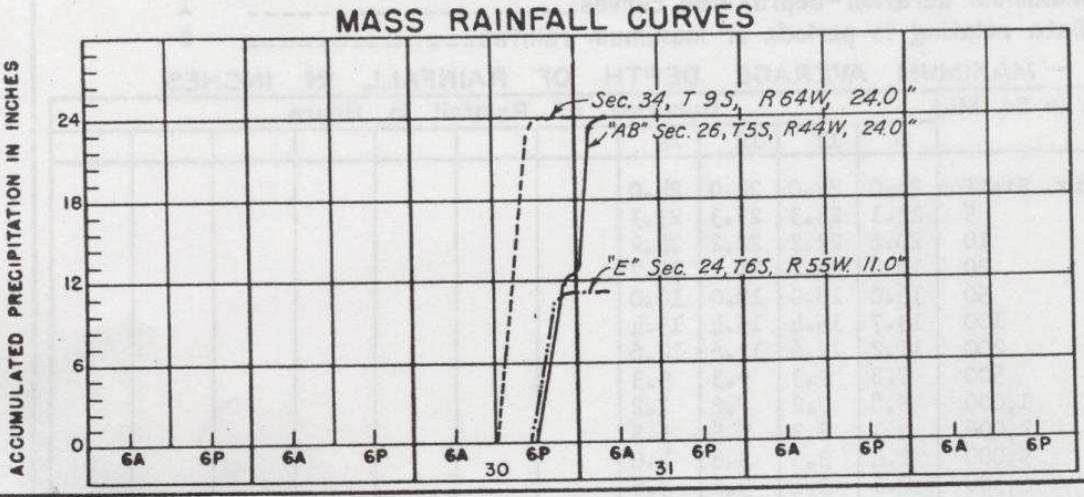
Study Prepared by: Kansas City, Mo. District
Missouri River Division



Storm Period 24 hours
from 6 AM May 30
to 6 AM May 31

SCALE
1
19,000,000
Polyconic Projection

MASS RAINFALL CURVES



FORM 8-3W

Hallett, OK September 2, 1940
Storm Type: MCC

Storm Name:	**Hallett, OK**
Storm Date:	**02-Sep-1940**
AWA Analysis Date:	**12/2/2008**

Storm Adjustment for Nebraska Grid Point 5

Temporal Transposition Date **17-Aug**

	Lat	Long
Storm center location	**36.23 N**	**96.57 W**
Storm Rep dew point location	**35.23 N**	**96.06 W**
Transposition dewpoint location	**38.25 N**	**94.49 W**
Basin location	**41.25 N**	**96.66 W**

Moisture Inflow Direction:	**SSE @ 75**	miles
Basin Elevation	**1,300**	feet
Storm Elevation	**930**	feet
Storm Duration	**12hr**	feet

The storm representative dew point is	**78.0 F**	with total precipitable water above sea level of			**3.29**	inches.
The in-place maximum dew point is	**79.5 F**	with total precipitable water above sea level of			**3.52**	inches.
The transpositioned maximum dew point is	**80.5 F**	with total precipitable water above sea level of			**3.68**	inches.
The in-place storm elevation is	**930**	which subtracts	**0.26**	inches of precipitable water at	**78.0 F**	
The in-place storm elevation is	**930**	which subtracts	**0.27**	inches of precipitable water at	**79.5 F**	
The transposition basin elevation at	**1,300**	which subtracts	**0.385**	inches of precipitable water at	**80.5 F**	
The inflow barrier/basin elevation height is	**1,300**	which subtracts	**0.385**	inches of precipitable water at	**80.5 F**	

The in-place storm maximization factor is	**1.07**
The transposition/elevation to basin factor is	**1.01**
The barrier adjustment factor is	**1.00**
The total adjustment factor is	**1.09**

Notes: DAD values taken from USACE Storm Studies SW 2-18

Observed Storm Depth-Area-Duration

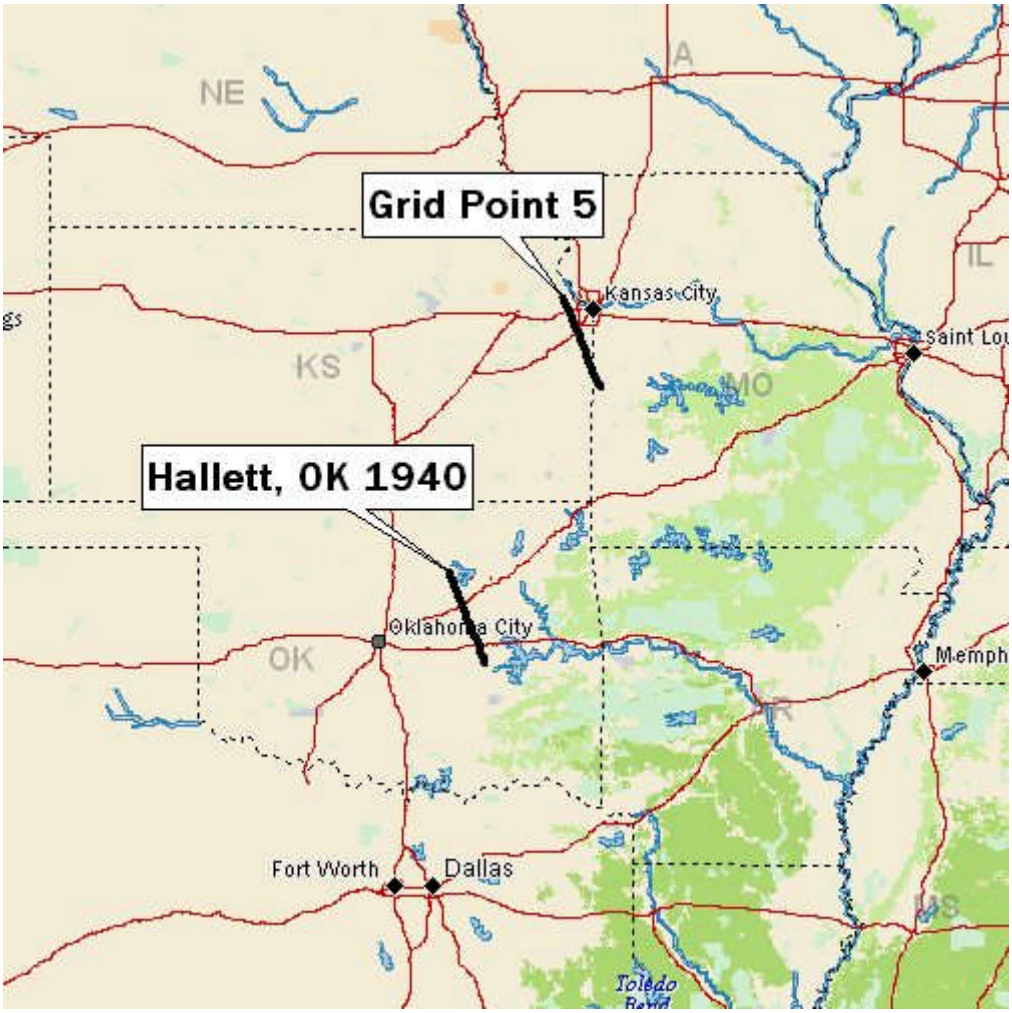
	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**18.4**	**23.4**	**23.6**	**23.6**	**23.6**	**23.6**	**0.0**	**0.0**	**0.0**
100 sq miles	**14.7**	**19.2**	**19.4**	**19.6**	**19.7**	**19.8**	**0.0**	**0.0**	**0.0**
200 sq miles	**12.5**	**17.6**	**17.8**	**18.0**	**18.1**	**18.3**	**0.0**	**0.0**	**0.0**
500 sq miles	**9.7**	**15.4**	**15.6**	**15.7**	**15.8**	**16.2**	**0.0**	**0.0**	**0.0**
1000 sq miles	**7.9**	**13.3**	**13.4**	**13.6**	**13.7**	**14.1**	**0.0**	**0.0**	**0.0**
5000 sq miles	**4.3**	**7.3**	**7.4**	**7.5**	**7.7**	**7.8**	**0.0**	**0.0**	**0.0**
10000 sq miles	**3.0**	**5.3**	**5.4**	**5.5**	**5.6**	**5.7**	**0.0**	**0.0**	**0.0**
20000 sq miles	**2.0**	**3.9**	**4.1**	**4.2**	**4.3**	**4.4**	**0.0**	**0.0**	**0.0**

Adjusted Storm Depth-Area-Duration

	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**20.0**	**25.4**	**25.7**	**25.7**	**25.7**	**25.7**	**0.0**	**0.0**	**0.0**
100 sq miles	**16.0**	**20.9**	**21.1**	**21.3**	**21.4**	**21.5**	**0.0**	**0.0**	**0.0**
200 sq miles	**13.6**	**19.1**	**19.4**	**19.6**	**19.7**	**19.9**	**0.0**	**0.0**	**0.0**
500 sq miles	**10.5**	**16.7**	**17.0**	**17.1**	**17.2**	**17.6**	**0.0**	**0.0**	**0.0**
1000 sq miles	**8.6**	**14.5**	**14.6**	**14.8**	**14.9**	**15.3**	**0.0**	**0.0**	**0.0**
5000 sq miles	**4.7**	**7.9**	**8.0**	**8.2**	**8.4**	**8.5**	**0.0**	**0.0**	**0.0**
10000 sq miles	**3.3**	**5.8**	**5.9**	**6.0**	**6.1**	**6.2**	**0.0**	**0.0**	**0.0**
20000 sq miles	**2.2**	**4.2**	**4.5**	**4.6**	**4.7**	**4.8**	**0.0**	**0.0**	**0.0**

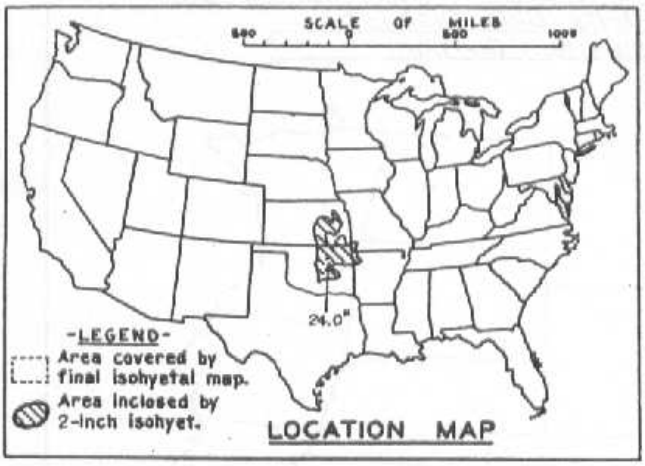
Storm or Storm Center Name	**Hallett, OK**
Storm Date(s)	2-Sep-1940
Storm Type	MCC
Storm Location	36.23 N 96.57 W
Storm Center Elevation	930
Precipitation Total & Duration	24.00 Inches 12-hours USACE Storm Studies SW 2-18
Storm Representative Dewpoint	78.0 F 12hr average, added 7° to the USACE storm rep Td based on EPRI and Wanahoo guidance
Storm Representative Dewpoint Location	35.23 N 96.06 W
Maximum Dewpoint	79.5 F
Moisture Inflow Vector	SSE @ 75 Miles
In-place Maximization Factor	1.07
Temporal Transposition (Date)	17-Aug
Transposition Dewpoint Location	38.25 N 94.49 W
Transposition Maximum Dewpoint	80.5 F
Basin Elevation	1,300
Transposition to Basin Adjustment Factor	1.01
Higher of Basin Elevation - Inflow Barrier Height	1,300
Elevation Adjustment Factor	1.00
Total Adjustment Factor	1.09

Hallett, OK September 2, 1940 Inflow



WAR DEPARTMENT CORPS OF ENGINEERS, U. S. ARMY

STORM STUDIES - PERTINENT DATA SHEET



LOCATION MAP

Storm of September 2 - 6, 1940
Assignment S W 2 - 18
Location Okla. Kans. Mo. & Ark.
Study Prepared by:
Southwestern Division
Tulsa District Office

Part I Reviewed by H. M. Sec. of Weather Bureau, 8/18/41
Part II Approved by Office, Chief of Engineers for Distribution of Factual Data, 3/25/43
Remarks: Centers at; Hallett, Okla. and Lebo, Kans.

DATA AND COMPUTATIONS COMPILED

PART I

Preliminary isohyetal map, in 2 sheet, scale 1 : 1,000,000

Precipitation data and mass curves: (Number of Sheets)

Form 5001-C (Hourly precip. data)	38
Form 5001-B (24-hour " ")	-
Form 5001-D (" " " ")	23
Misc. precip. records, meteorological data, etc.	1
Form 5002 (Mass rainfall curves)	49

PART II

Final isohyetal maps, in 1 sheet, scale 1 : 1,000,000

Data and computation sheets:

Form S-10 (Data from mass rainfall curves)	9
Form S-11 (Depth-area data from isohyetal map)	3
Form S-12 (Maximum depth-duration data)	11
Maximum duration-depth-area curves	1
Data relating to periods of maximum rainfall	2

MAXIMUM AVERAGE DEPTH OF RAINFALL IN INCHES

Area in Sq. Mi.	Duration of Rainfall in Hours										
	6	12	18	24	30	36	48	54	90		
Max. Station	18.9	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0		
10	18.4	23.4	23.6	23.6	23.6	23.6	23.6	23.6	23.6		
100	14.7	19.2	19.4	19.6	19.7	19.8	19.8	19.8	19.8		
200	12.5	17.6	17.8	18.0	18.1	18.2	18.3	18.3	18.3		
500	9.7	15.4	15.6	15.7	15.8	16.1	16.2	16.2	16.2		
1,000	7.9	13.3	13.4	13.6	13.7	14.0	14.1	14.1	14.1		
2,000	6.2	10.3	10.5	10.7	10.9	11.1	11.3	11.3	11.3		
5,000	4.3	7.3	7.4	7.5	7.7	7.8	7.9	8.0	8.0		
10,000	3.0	5.3	5.4	5.5	5.6	5.7	5.8	5.9	5.9		
15,000	2.4	4.4	4.5	4.7	4.7	4.8	4.9	5.1	5.1		
20,000	2.0	3.9	4.1	4.2	4.3	4.4	4.5	4.6	4.6		

Form S-2

WAR DEPARTMENT — CORPS OF ENGINEERS, U. S. ARMY

STORM STUDIES – ISOHYETAL MAP

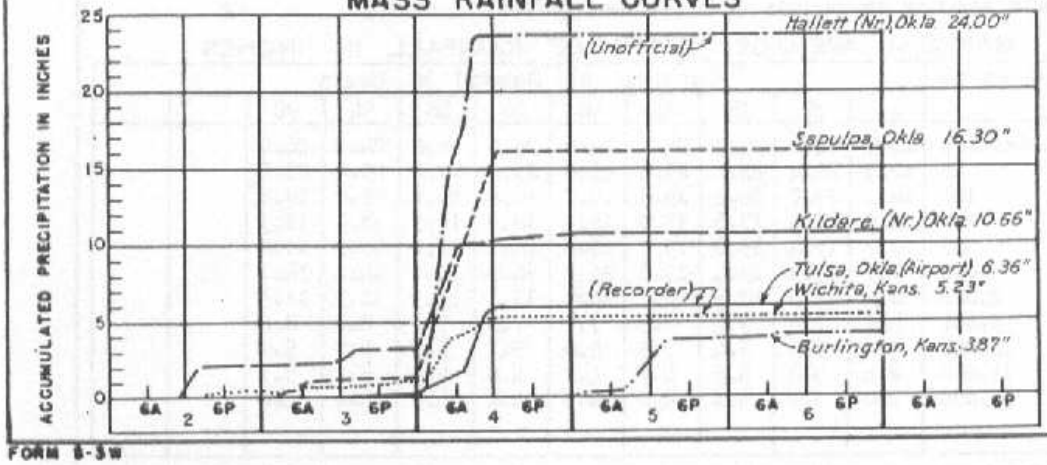
Storm of *September 2-6, 1940* Assignment *SW 2-18*

Study Prepared by: *Tulsa, Okla. District*
Southwestern Division

Storm Period *90* hours
from *7 AM Sept. 2*
to *1 AM Sept. 6*

SCALE
1
19,000,000
Polyconic Projection

MASS RAINFALL CURVES



FORM 8-SW

Hayward, WI August 28, 1941
Storm Type: Synoptic

Storm Name:	**Hayward, WI**
Storm Date:	**28-Aug-1941**
AWA Analysis Date:	**12/2/2008**

Storm Adjustment for Nebraska Grid Point 10

Temporal Transposition Date **15-Aug**

	Lat	Long
Storm center location	**46.04 N**	**91.48 W**
Storm Rep dew point location	**42.99 N**	**89.78 W**
Transposition dewpoint location	**37.70 N**	**95.30 W**
Basin location	**41.20 N**	**96.42 W**

Moisture Inflow Direction:	**SSE @ 225**	miles
Basin Elevation	**1,300**	feet
Storm Elevation	**1,250**	feet
Storm Duration	**24hr**	feet

Notes: DAD values taken from USACE UMV 1-22

The storm representative dew point is	**73.0 F**	with total precipitable water above sea level of			**2.60**	inches.
The in-place maximum dew point is	**78.5 F**	with total precipitable water above sea level of			**3.37**	inches.
The transpositioned maximum dew point is	**78.5 F**	with total precipitable water above sea level of			**3.37**	inches.
The in-place storm elevation is	**1,250**	which subtracts	**0.29**	inches of precipitable water at	**73.0 F**	
The in-place storm elevation is	**1,250**	which subtracts	**0.35**	inches of precipitable water at	**78.5 F**	
The transposition basin elevation at	**1,300**	which subtracts	**0.36**	inches of precipitable water at	**78.5 F**	
The inflow barrier/basin elevation height is	**1,300**	which subtracts	**0.36**	inches of precipitable water at	**78.5 F**	

The in-place storm maximization factor is	**1.30**
The transposition/elevation to basin factor is	**1.00**
The barrier adjustment factor is	**1.00**
The total adjustment factor is	**1.30**

Notes: DAD values taken from USACE UMV 1-22. In-place max factor calculated at 1.31, however rounding of values produces a total adjustment value of 1.30.

Observed Storm Depth-Area-Duration

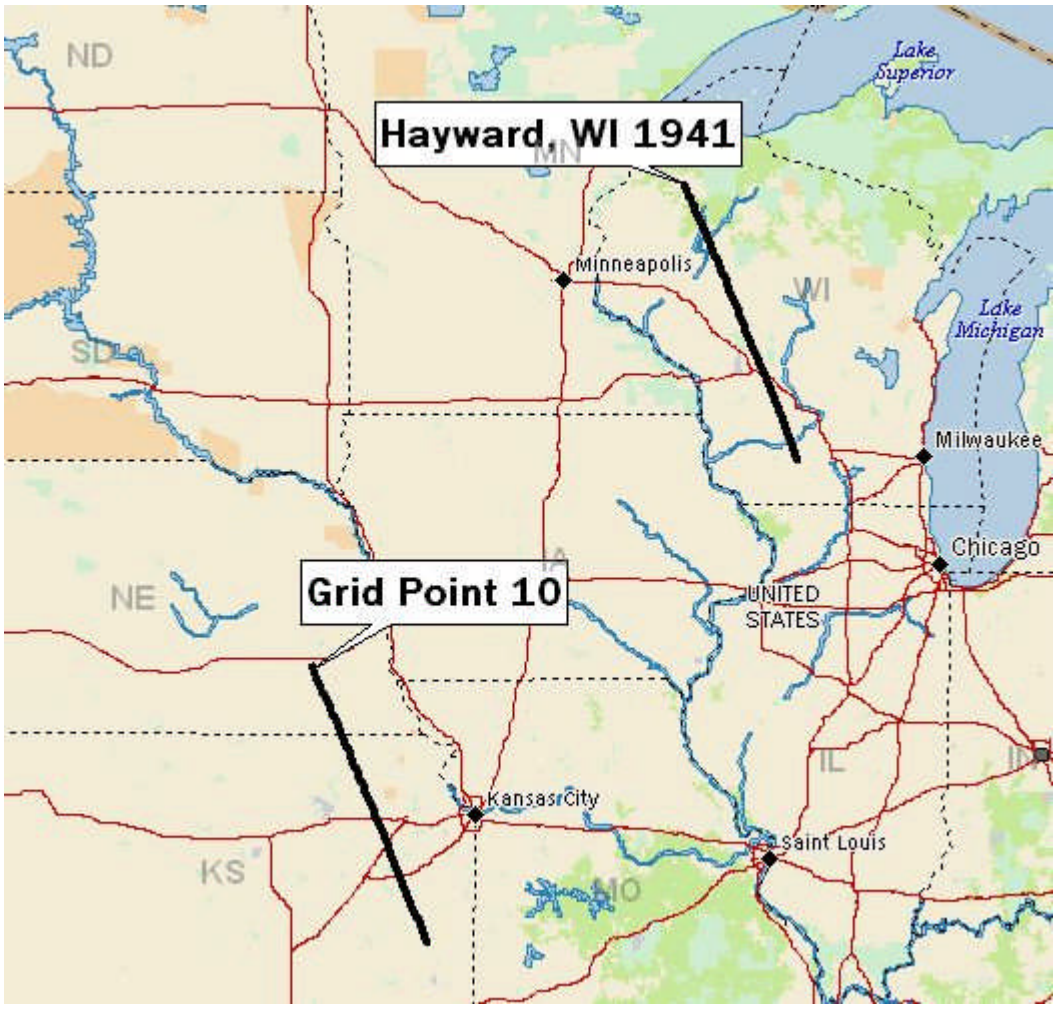
	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**8.5**	**11.5**	**12.4**	**12.4**	**13.3**	**13.8**	**14.4**	**15.0**	**15.0**
100 sq miles	**8.1**	**11.0**	**11.8**	**11.8**	**12.7**	**13.3**	**13.8**	**14.3**	**14.5**
200 sq miles	**7.8**	**10.6**	**11.3**	**11.3**	**12.3**	**13.0**	**13.4**	**13.9**	**14.1**
500 sq miles	**6.8**	**9.5**	**10.2**	**10.3**	**11.2**	**12.0**	**12.5**	**12.9**	**13.1**
1000 sq miles	**5.6**	**8.2**	**9.0**	**9.1**	**10.0**	**10.9**	**11.5**	**11.9**	**12.0**
5000 sq miles	**3.0**	**5.2**	**5.9**	**6.3**	**7.2**	**8.1**	**8.9**	**9.3**	**9.5**
10000 sq miles	**2.1**	**3.8**	**4.6**	**5.1**	**5.9**	**6.0**	**7.8**	**8.2**	**8.4**
20000 sq miles	**1.5**	**2.7**	**3.4**	**3.8**	**4.7**	**5.5**	**6.5**	**7.1**	**7.3**

Adjusted Storm Depth-Area-Duration

	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**11.0**	**14.9**	**16.1**	**16.1**	**17.2**	**17.9**	**18.7**	**19.4**	**19.4**
100 sq miles	**10.5**	**14.3**	**15.3**	**15.3**	**16.5**	**17.2**	**17.9**	**18.5**	**18.8**
200 sq miles	**10.1**	**13.7**	**14.6**	**14.6**	**15.9**	**16.8**	**17.4**	**18.0**	**18.3**
500 sq miles	**8.8**	**12.3**	**13.2**	**13.3**	**14.5**	**15.5**	**16.2**	**16.7**	**17.0**
1000 sq miles	**7.3**	**10.6**	**11.7**	**11.8**	**13.0**	**14.1**	**14.9**	**15.4**	**15.5**
5000 sq miles	**3.9**	**6.7**	**7.6**	**8.2**	**9.3**	**10.5**	**11.5**	**12.0**	**12.3**
10000 sq miles	**2.7**	**4.9**	**6.0**	**6.6**	**7.6**	**7.8**	**10.1**	**10.6**	**10.9**
20000 sq miles	**1.9**	**3.5**	**4.4**	**4.9**	**6.1**	**7.1**	**8.4**	**9.2**	**9.5**

Storm or Storm Center Name	**Hayward, WI**
Storm Date(s)	28-Aug-1941
Storm Type	Synoptic
Storm Location	46.04 N 91.48 W
Storm Center Elevation	1,250
Precipitation Total & Duration	15.00 Inches 72-hours USACE UMV 1-22
Storm Representative Dewpoint	73.0 F 24hr average
Storm Representative Dewpoint Location	42.99 N 89.78 W
Maximum Dewpoint	78.5 F
Moisture Inflow Vector	SSE @ 225 Miles
In-place Maximization Factor	1.30
Temporal Transposition (Date)	15-Aug
Transposition Dewpoint Location	37.70 N 95.30 W
Transposition Maximum Dewpoint	78.5 F
Basin Elevation	1,300
Transposition to Basin Adjustment Factor	1.00
Higher of Basin Elevation - Inflow Barrier Height	1,300
Elevation Adjustment Factor	1.00
Total Adjustment Factor	1.30

Hayward, WI August 28, 1941 Inflow



WAR DEPARTMENT — CORPS OF ENGINEERS, U.S. ARMY

STORM STUDIES - PERTINENT DATA SHEET

LOCATION MAP

Storm of August 28 - 31, 1941
Assignment U M V 1 - 22
Location Northern Wisconsin and Minn.
Study Prepared by: Upper Mississippi Valley Division
St. Paul District Office
Part I Reviewed by H. M. Sec. of Weather Bureau, 3/24/42
Part II Approved by Office, Chief of Engineers for Distribution of Factual Data, 4/11/45
Remarks: Center at: Haywood and Moose Lake, Wisc.

DATA AND COMPUTATIONS COMPILED

PART I

Preliminary isohyetal map, in 4 sheet, scale 1 : 1,000,000

Precipitation data and mass curves: (Number of Sheets)

Form 5001-C (Hourly precip. data)	33
Form 5001-B (24-hour " ")	-
Form 5001-D (" " " ")	14
Misc. precip. records, meteorological data, etc.	3
Form 5002 (Mass rainfall curves)	42

PART II

Final isohyetal maps, in 1 sheet, scale 1,000,000

Data and computation sheets:

Form S-10 (Data from mass rainfall curves)	6
Form S-11 (Depth-area data from isohyetal map)	2
Form S-12 (Maximum depth-duration data)	8
Maximum duration-depth-area curves	1
Data relating to periods of maximum rainfall	2

MAXIMUM AVERAGE DEPTH OF RAINFALL IN INCHES

Area in Sq. Mi.	Duration of Rainfall in Hours										
	6	12	18	24	30	36	48	60	72	78	
10	8.5	11.5	12.4	12.4	13.3	13.8	14.4	15.0	15.0	15.0	
100	8.1	11.0	11.8	11.8	12.7	13.3	13.8	14.3	14.5	14.5	
200	7.8	10.6	11.3	11.3	12.3	13.0	13.4	13.9	14.1	14.1	
500	6.8	9.5	10.2	10.3	11.2	12.0	12.5	12.9	13.1	13.1	
1,000	5.6	8.2	9.0	9.1	10.0	10.9	11.5	11.9	12.0	12.0	
2,000	4.3	6.9	7.7	7.9	8.8	9.7	10.4	10.8	10.9	10.9	
5,000	3.0	5.2	5.9	6.3	7.2	8.1	8.9	9.3	9.5	9.5	
10,000	2.1	3.8	4.6	5.1	5.9	6.8	7.8	8.2	8.4	8.4	
20,000	1.5	2.7	3.4	3.8	4.7	5.5	6.5	7.1	7.3	7.3	
50,000	0.9	1.6	2.1	2.5	3.1	3.6	4.5	5.1	5.2	5.2	
60,000	0.8	1.4	1.9	2.2	2.8	3.3	4.1	4.5	4.7	4.7	

Form S-2

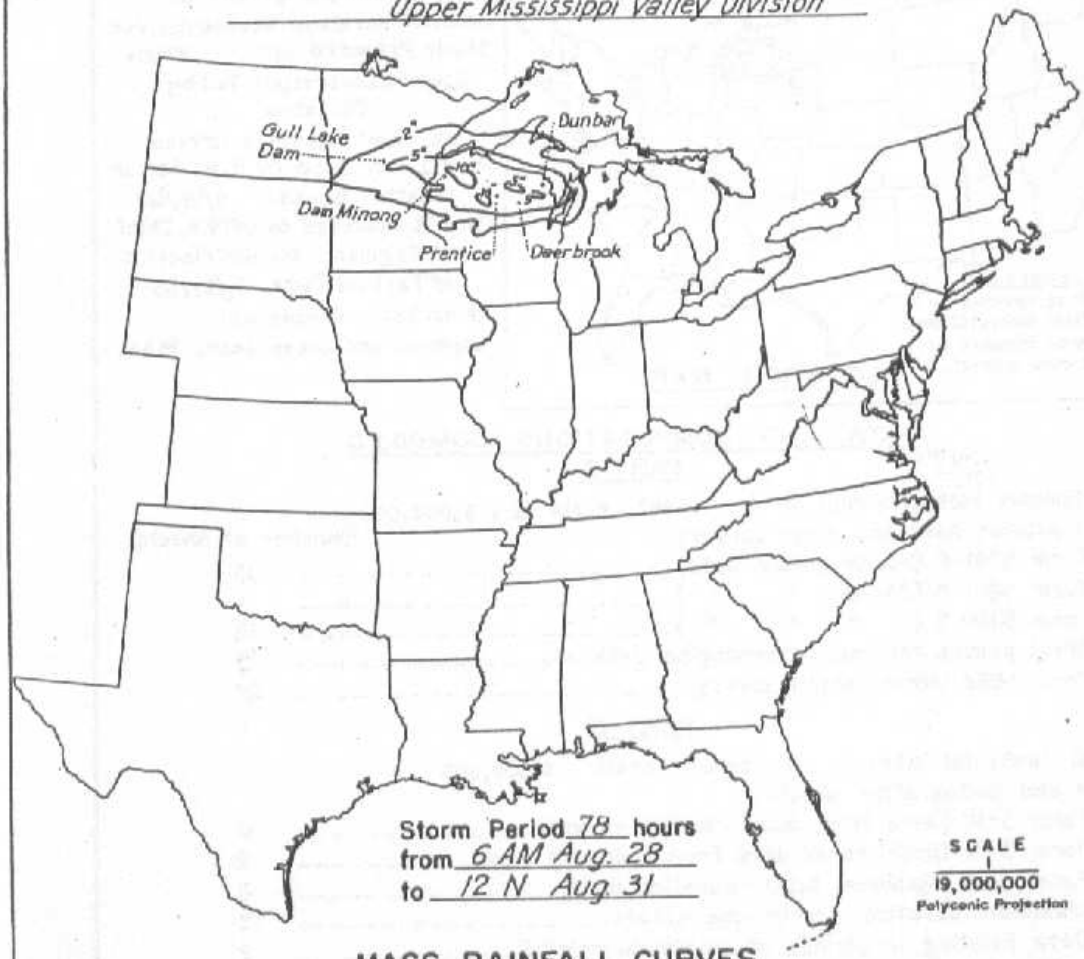
WAR DEPARTMENT

CORPS OF ENGINEERS, U. S. ARMY

STORM STUDIES – ISOHYETAL MAP

Storm of August 28-31, 1941 Assignment UMV 1-22

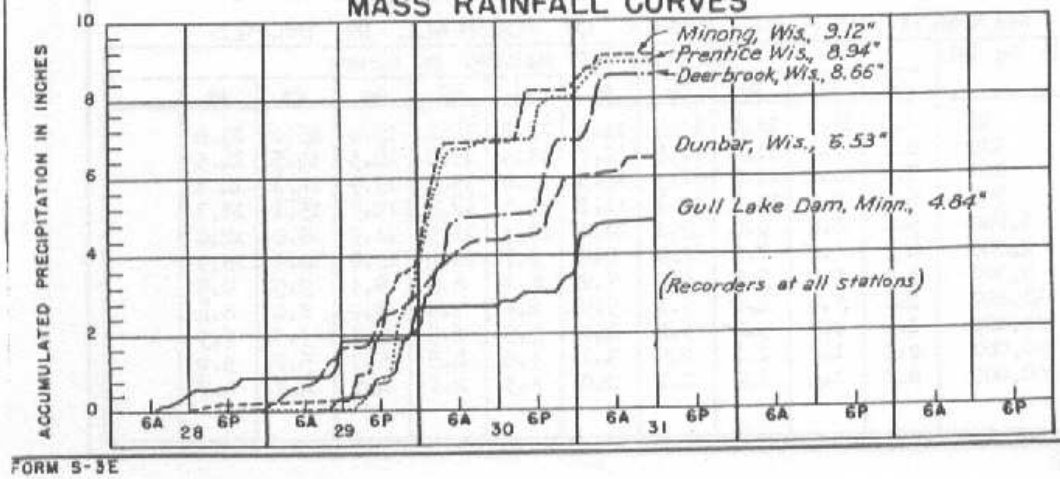
Study Prepared by: St. Paul, Minn. District
Upper Mississippi Valley Division



Storm Period 78 hours
from 6 AM Aug. 28
to 12 N Aug. 31

SCALE
1/9,000,000
Polyconic Projection

MASS RAINFALL CURVES



FORM S-3E

Hokah, MN August 18-21, 2007
Storm Type: Hybrid

Storm Name:	**Hokah, MN**
Storm Date:	**18-Aug-2007**
AWA Analysis Date:	**12/2/2008**

Storm Adjustment for Nebraska Grid Point 10

Temporal Transposition Date **3-Aug**

	Lat	Long
Storm center location	**43.81 N**	**91.52 W**
Storm Rep dew point location	**38.91 N**	**93.85 W**
Transposition dewpoint location	**35.85 N**	**99.33 W**
Basin location	**41.25 N**	**96.66 W**

Moisture Inflow Direction:	**SSW @ 360**	miles
Basin Elevation	**1,300**	feet
Storm Elevation	**1,000**	feet
Storm Duration	**24hr ave**	feet

The storm representative dew point is	**74.0 F**	with total precipitable water above sea level of			**2.73**	inches.
The in-place maximum dew point is	**79.0 F**	with total precipitable water above sea level of			**3.44**	inches.
The transpositioned maximum dew point is	**78.0 F**	with total precipitable water above sea level of			**3.29**	inches.
The in-place storm elevation is	**1,000**	which subtracts	**0.14**	inches of precipitable water at	**74.0 F**	
The in-place storm elevation is	**1,000**	which subtracts	**0.16**	inches of precipitable water at	**79.0 F**	
The transposition basin elevation at	**1,300**	which subtracts	**0.36**	inches of precipitable water at	**78.0 F**	
The inflow barrier/basin elevation height is	**1,300**	which subtracts	**0.36**	inches of precipitable water at	**78.0 F**	

The in-place storm maximization factor is	**1.27**
The transposition/elevation to basin factor is	**0.89**
The barrier adjustment factor is	**1.00**
The total adjustment factor is	**1.13**

Notes: DAD values taken from SPAS 1048

Observed Storm Depth-Area-Duration

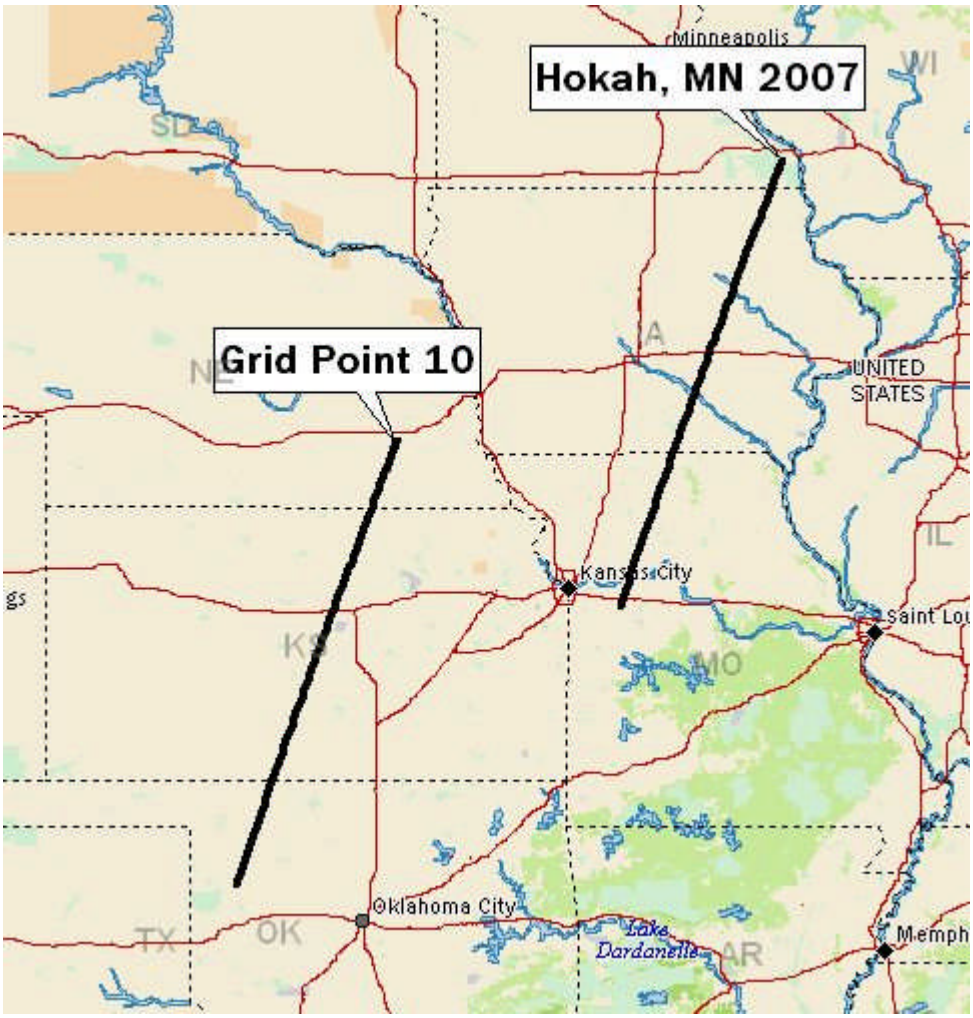
	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**7.5**	**11.1**	**13.9**	**16.0**	**0.0**	**16.3**	**17.0**	**0.0**	**17.2**
100 sq miles	**6.3**	**9.4**	**11.5**	**13.3**	**0.0**	**13.9**	**14.8**	**0.0**	**15.1**
200 sq miles	**6.0**	**8.9**	**11.0**	**12.6**	**0.0**	**13.4**	**14.2**	**0.0**	**14.5**
500 sq miles	**5.5**	**8.1**	**10.1**	**11.6**	**0.0**	**12.3**	**13.0**	**0.0**	**13.3**
1000 sq miles	**5.0**	**7.3**	**9.2**	**10.5**	**0.0**	**11.1**	**11.8**	**0.0**	**12.1**
5000 sq miles	**3.5**	**5.2**	**6.5**	**7.6**	**0.0**	**8.2**	**8.8**	**0.0**	**9.0**
10000 sq miles	**2.7**	**4.0**	**5.4**	**6.1**	**0.0**	**6.8**	**7.3**	**0.0**	**7.5**
20000 sq miles	**1.8**	**3.0**	**4.0**	**4.5**	**0.0**	**5.1**	**5.6**	**0.0**	**5.9**

Adjusted Storm Depth-Area-Duration

	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**8.5**	**12.6**	**15.7**	**18.1**	**0.0**	**18.5**	**19.3**	**0.0**	**19.4**
100 sq miles	**7.2**	**10.6**	**13.0**	**15.0**	**0.0**	**15.8**	**16.7**	**0.0**	**17.1**
200 sq miles	**6.8**	**10.0**	**12.4**	**14.3**	**0.0**	**15.1**	**16.1**	**0.0**	**16.4**
500 sq miles	**6.2**	**9.2**	**11.4**	**13.1**	**0.0**	**13.9**	**14.7**	**0.0**	**15.0**
1000 sq miles	**5.6**	**8.3**	**10.4**	**11.9**	**0.0**	**12.6**	**13.4**	**0.0**	**13.7**
5000 sq miles	**3.9**	**5.9**	**7.4**	**8.6**	**0.0**	**9.3**	**9.9**	**0.0**	**10.1**
10000 sq miles	**3.0**	**4.5**	**6.1**	**6.9**	**0.0**	**7.7**	**8.3**	**0.0**	**8.5**
20000 sq miles	**2.1**	**3.4**	**4.5**	**5.1**	**0.0**	**5.8**	**6.4**	**0.0**	**6.6**

Storm or Storm Center Name	**Hokah, MN**	
Storm Date(s)	18-Aug-2007	
Storm Type	Synoptic/Thunderstorms	
Storm Location	43.81 N	91.52 W
Storm Center Elevation	1,000	
Precipitation Total & Duration	18.93 Inches 72-hours-SPAS 1048	
Storm Representative Dewpoint	74.0 F	24hr ave KIXD, KLXT, KMCI, KMKC, KOJC, KSTJ, KSZL-17th 00Z to 18 00Z
Storm Representative Dewpoint Location	38.91 N	93.85 W
Maximum Dewpoint	79.0 F	
Moisture Inflow Vector	SSW @ 360	
In-place Maximization Factor	1.27	
Temporal Transposition (Date)	3-Aug	
Transposition Dewpoint Location	35.85 N	99.33 W
Transposition Maximum Dewpoint	78.0 F	
Basin Elevation	1,300	
Transposition to Basin Adjustment Factor	0.89	
Higher of Basin Elevation - Inflow Barrier Height	1,300	
Elevation Adjustment Factor	1.00	
Total Adjustment Factor	1.13	

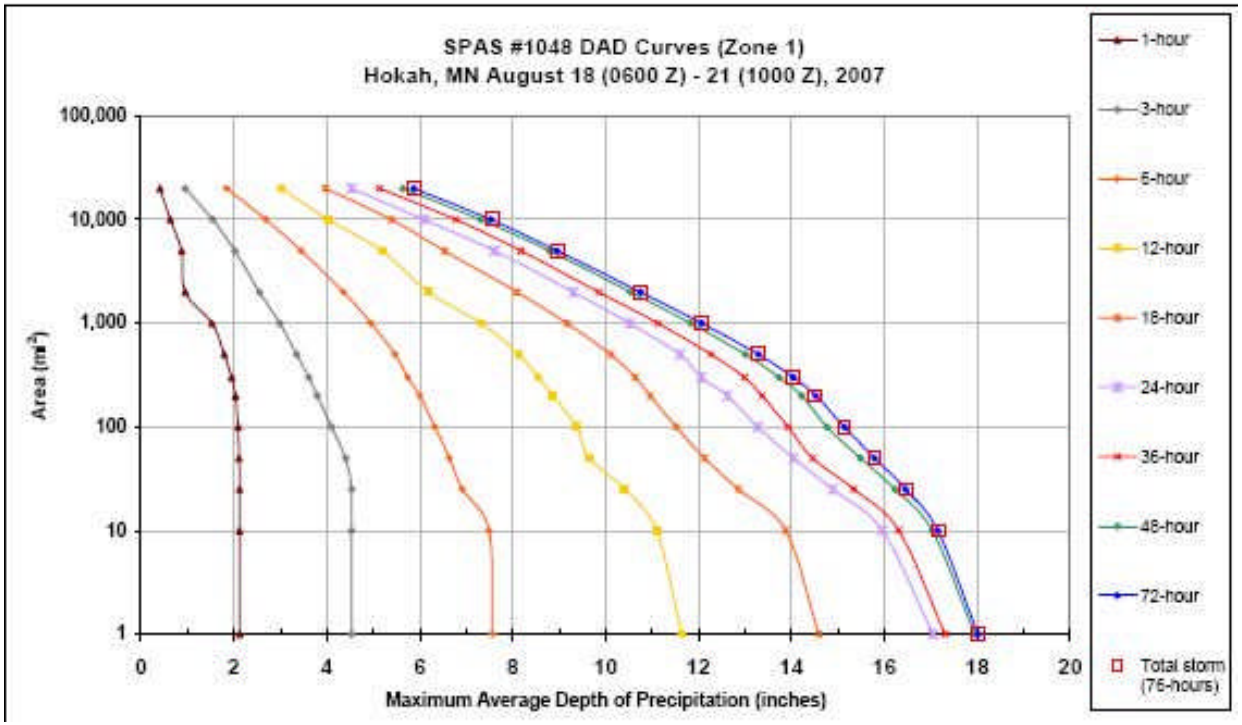
Hokah, MN August 18-21, 2007 Inflow

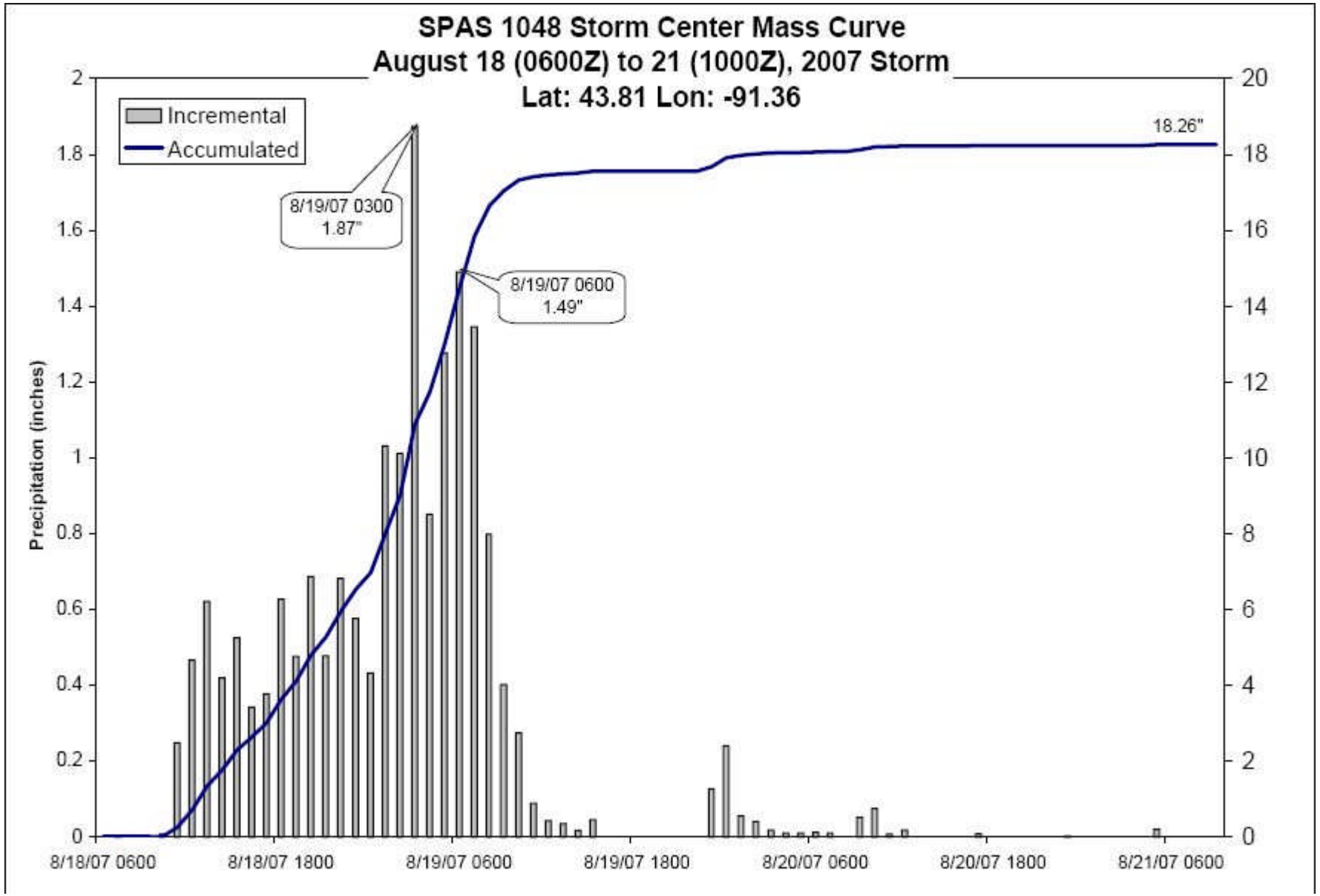


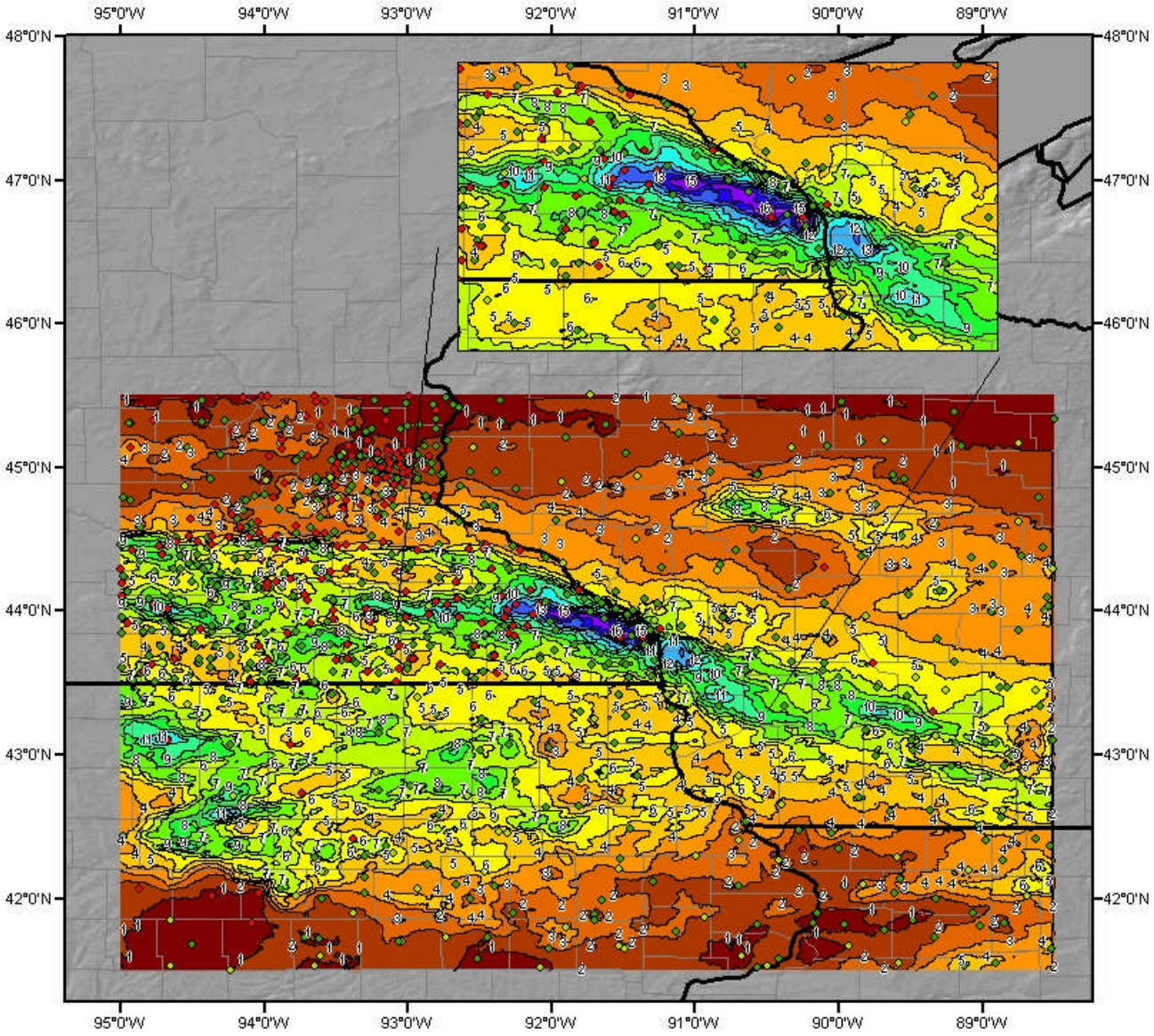
Storm 1048 - Hokah, MN August 18 - August 21, 2007

MAXIMUM AVERAGE DEPTH OF PRECIPITATION (INCHES)

Area (mi^2)	Duration (hours)									
	1	3	6	12	18	24	36	48	72	Total
0.24	2.45	4.77	7.85	11.89	14.88	17.31	17.55	18.19	18.26	18.26
1	2.12	4.53	7.56	11.64	14.59	17.05	17.31	17.95	18.02	18.02
10	2.12	4.53	7.49	11.10	13.88	15.96	16.31	17.03	17.15	17.17
25	2.12	4.53	6.92	10.42	12.86	14.89	15.34	16.23	16.45	16.46
50	2.11	4.40	6.64	9.65	12.13	14.05	14.46	15.49	15.79	15.79
100	2.09	4.10	6.33	9.37	11.52	13.27	13.93	14.76	15.14	15.14
200	2.03	3.79	6.00	8.87	10.96	12.62	13.37	14.22	14.52	14.52
300	1.95	3.61	5.74	8.55	10.64	12.06	12.99	13.74	14.04	14.04
500	1.79	3.35	5.47	8.13	10.11	11.60	12.27	13.01	13.29	13.30
1,000	1.53	2.99	4.95	7.33	9.17	10.51	11.13	11.84	12.07	12.07
2,000	0.95	2.55	4.36	6.18	8.09	9.30	9.85	10.54	10.75	10.76
5,000	0.87	2.02	3.45	5.19	6.53	7.61	8.18	8.79	8.96	8.98
10,000	0.63	1.54	2.69	4.02	5.39	6.09	6.78	7.31	7.53	7.55
20,000	0.41	0.95	1.84	3.02	3.97	4.53	5.13	5.63	5.87	5.90




SPAS 1048 Storm Center Mass Curve
August 18 (0600Z) to 21 (1000Z), 2007 Storm
Lat: 43.81 Lon: -91.36
Incremental
Accumulated
8/19/07 0300
1.87"
8/19/07 0600
1.49"
18.26"
Precipitation (inches)
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8
2
0
2
4
6
8
10
12
14
16
18
20
8/18/07 0600
8/18/07 1800
8/19/07 0600
8/19/07 1800
8/20/07 0600
8/20/07 1800
8/21/07 0600



Total Rainfall (76-hours)
Hokah, MN 2007 Storm
Storm #1048 August 18 (0600 Z) to 21 (1000 Z), 2007

Miles
0 25 50 100
Kilometers
0 45 90 180 270

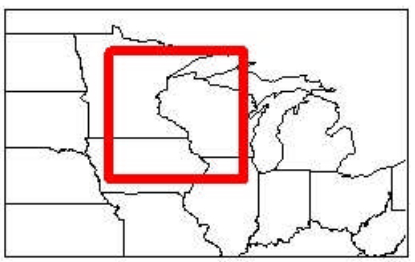
Gauging Stations

Daily Hourly Hourly Pseudo Supplemental

Precipitation (inches)

0.00 - 1.00	5.01 - 6.00	10.01 - 11.00	15.01 - 16.00
1.01 - 2.00	6.01 - 7.00	11.01 - 12.00	16.01 - 17.00
2.01 - 3.00	7.01 - 8.00	12.01 - 13.00	17.01 - 18.00
3.01 - 4.00	8.01 - 9.00	13.01 - 14.00	18.01 - 19.00
4.01 - 5.00	9.01 - 10.00	14.01 - 15.00	

N



Coordinate system: GCS North American 1983
Scale: 1:4,350,819

Holly, CO June 17, 1965
Storm Type: Hybrid

Storm Name:	**Holly, CO**
Storm Date:	**6/17-18/1965**
AWA Analysis Date:	**12/2/2008**

Storm Adjustment for Nebraska Grid Point 14

Temporal Transposition Date **3-Jul**

	Lat	Long
Storm center location	**38.05 N**	**102.12 W**
Storm Rep dew point location	**34.31 N**	**100.22 W**
Transposition dewpoint location	**38.51 N**	**99.10 W**
Basin location	**41.25 N**	**96.66 W**

Moisture Inflow Direction:	**SSE @ 280**	miles
Basin Elevation	**1,300**	feet
Storm Elevation	**3,400**	feet
Storm Duration	**12hr**	feet

The storm representative dew point is	**76.0 F**	with total precipitable water above sea level of			**2.99**	inches.
The in-place maximum dew point is	**79.5 F**	with total precipitable water above sea level of			**3.52**	inches.
The transpositioned maximum dew point is	**80.0 F**	with total precipitable water above sea level of			**3.60**	inches.
The in-place storm elevation is	**3,400**	which subtracts	**0.81**	inches of precipitable water at	**76.0 F**	
The in-place storm elevation is	**3,400**	which subtracts	**0.915**	inches of precipitable water at	**79.5 F**	
The transposition basin elevation at	**1,300**	which subtracts	**0.38**	inches of precipitable water at	**80.0 F**	
The inflow barrier/basin elevation height is	**1,300**	which subtracts	**0.38**	inches of precipitable water at	**80.0 F**	

The in-place storm maximization factor is	**1.19**
The transposition/elevation to basin factor is	**1.24**
The barrier adjustment factor is	**1.00**
The total adjustment factor is	**1.48**

Notes: DAD values taken from HRM 51

Observed Storm Depth-Area-Duration

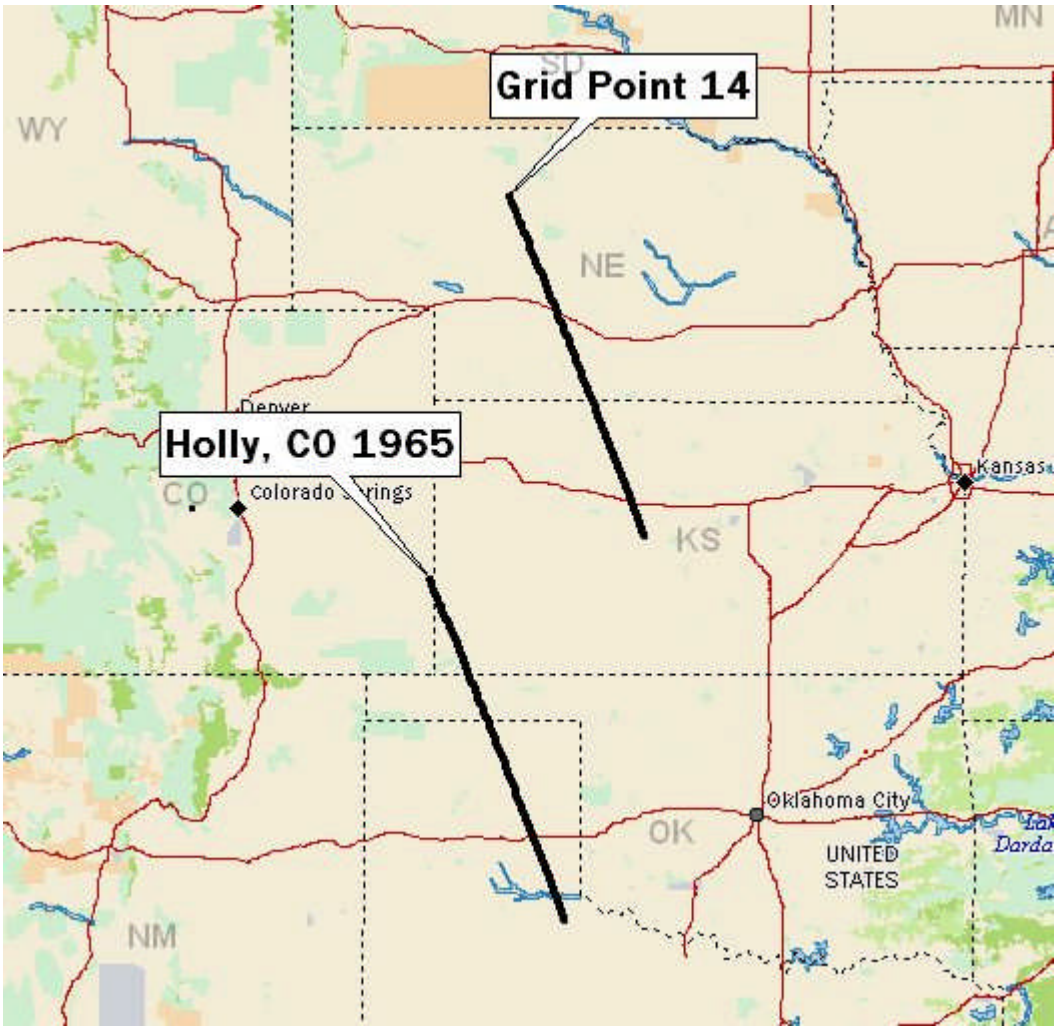
	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**7.4**	**7.5**	**9.1**	**12.6**	**0.0**	**12.8**	**13.6**	**0.0**	**0.0**
100 sq miles	**6.7**	**6.8**	**7.9**	**11.1**	**0.0**	**11.2**	**12.0**	**0.0**	**0.0**
200 sq miles	**6.1**	**6.3**	**7.1**	**10.0**	**0.0**	**10.2**	**10.9**	**0.0**	**0.0**
500 sq miles	**5.4**	**5.6**	**5.9**	**8.4**	**0.0**	**8.6**	**9.0**	**0.0**	**0.0**
1000 sq miles	**4.9**	**5.1**	**5.4**	**7.2**	**0.0**	**7.5**	**7.8**	**0.0**	**0.0**
5000 sq miles	**2.9**	**3.4**	**3.6**	**4.8**	**0.0**	**5.3**	**5.6**	**0.0**	**0.0**
10000 sq miles	**2.1**	**2.5**	**2.7**	**3.8**	**0.0**	**4.3**	**4.4**	**0.0**	**0.0**
20000 sq miles	**1.4**	**1.7**	**1.9**	**2.6**	**0.0**	**3.2**	**3.2**	**0.0**	**0.0**

Adjusted Storm Depth-Area-Duration

	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**11.0**	**11.1**	**13.5**	**18.7**	**0.0**	**18.8**	**20.1**	**0.0**	**0.0**
100 sq miles	**9.9**	**10.1**	**11.7**	**16.4**	**0.0**	**16.6**	**17.7**	**0.0**	**0.0**
200 sq miles	**9.1**	**9.3**	**10.5**	**14.8**	**0.0**	**15.1**	**16.0**	**0.0**	**0.0**
500 sq miles	**8.0**	**8.3**	**8.7**	**12.3**	**0.0**	**12.7**	**13.3**	**0.0**	**0.0**
1000 sq miles	**7.2**	**7.5**	**7.9**	**10.6**	**0.0**	**11.1**	**11.6**	**0.0**	**0.0**
5000 sq miles	**4.3**	**5.0**	**5.3**	**7.1**	**0.0**	**7.9**	**8.2**	**0.0**	**0.0**
10000 sq miles	**3.2**	**3.7**	**3.9**	**5.6**	**0.0**	**6.3**	**6.5**	**0.0**	**0.0**
20000 sq miles	**2.1**	**2.5**	**2.8**	**3.8**	**0.0**	**4.7**	**4.7**	**0.0**	**0.0**

Storm or Storm Center Name	**Holly, CO**	
Storm Date(s)	6/17-18/1965	
Storm Type	MCC-Thunderstorms	
Storm Location	38.05 N	102.12 W
Storm Center Elevation	3,400	Based on storm center isohyetal pattern location
Precipitation Total & Duration	15.54 inches in 50 hours, 15.17 inches in 24 hours	
Storm Representative Dewpoint	76.0 F	12hr average added 7°F to Td as accepted by EPRI Michigan Wisconsin and Wanahoo studies
Storm Representative Dewpoint Location	34.31 N	100.22 W
Maximum Dewpoint	79.5 F	
Moisture Inflow Vector	SSE @ 280 Miles	
In-place Maximization Factor	1.19	
Temporal Transposition (Date)	3-Jul	
Transposition Dewpoint Location	38.51 N	99.10 W
Transposition Maximum Dewpoint	80.0 F	
Basin Elevation	1,300	
Transposition to Basin Adjustment Factor	1.24	
Higher of Basin Elevation - Inflow Barrier Height	1,300	
Elevation Adjustment Factor	1.00	
Total Adjustment Factor	1.48	

Holly, CO June 17, 1965 Inflow

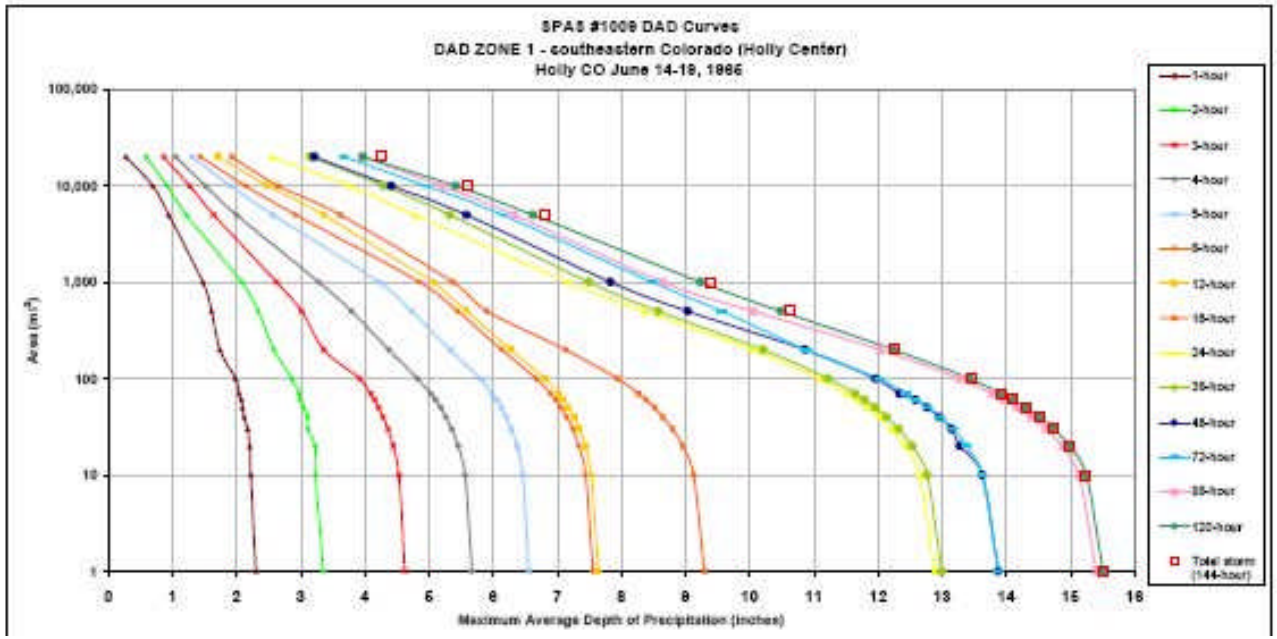


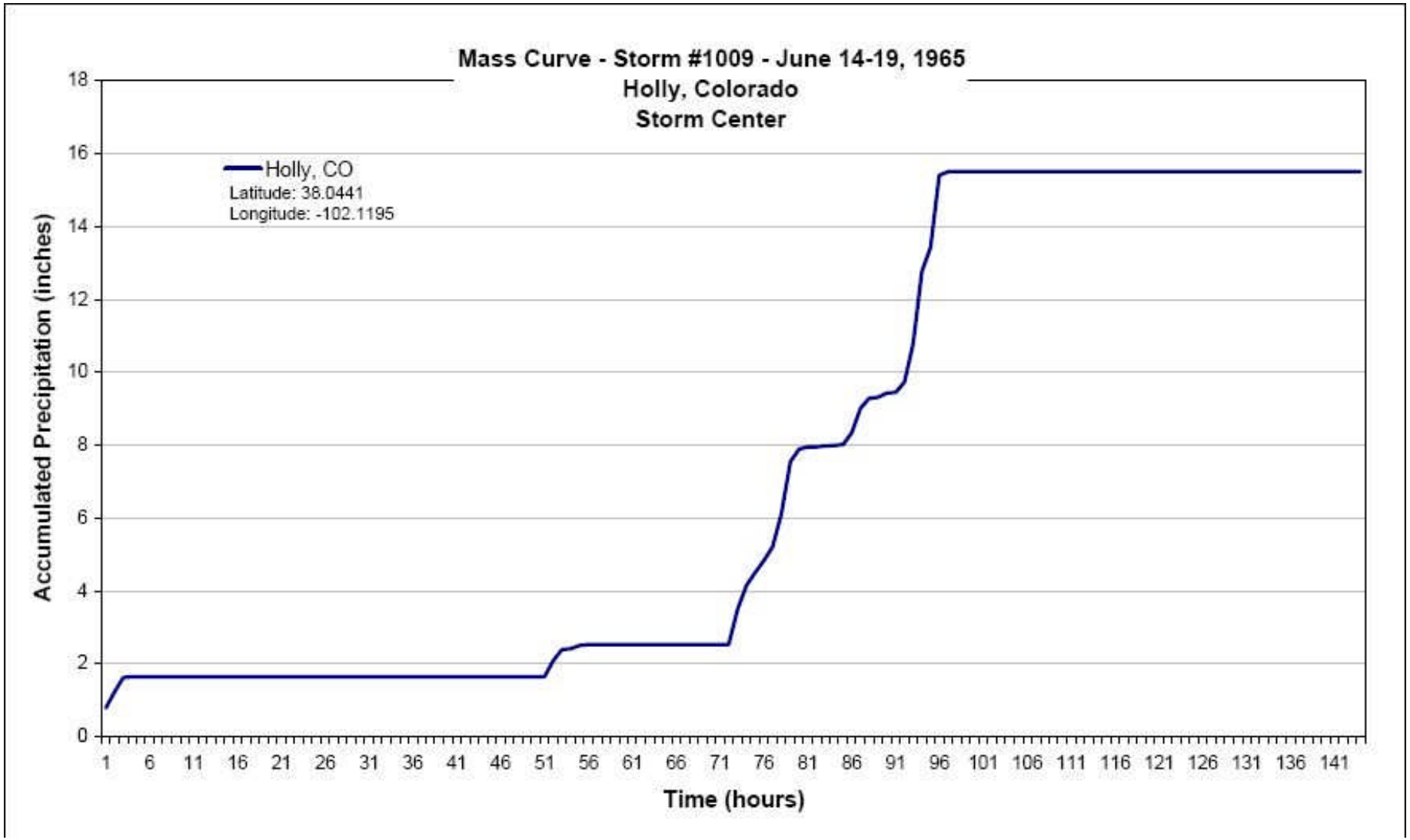
Storm 1009 - Holly, CO June 14-19, 1965

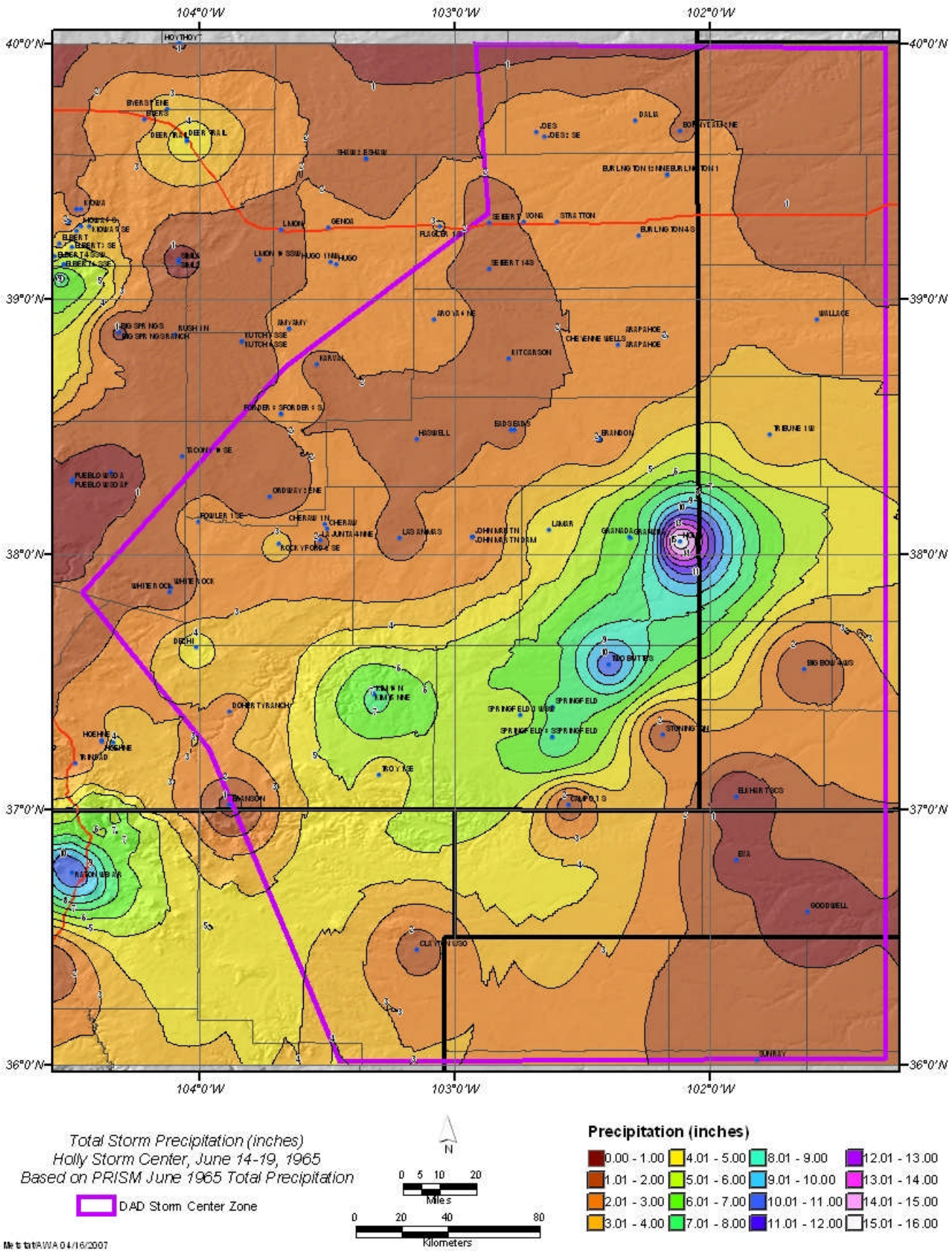
MAXIMUM AVERAGE DEPTH OF PRECIPITATION (INCHES)

Area (mi^2)	Duration (hours)															
	1	2	3	4	5	6	12	18	24	36	48	72	96	120	144	total (144-hr)
1	2.30	3.35	4.62	5.67	6.55	7.55	7.64	9.29	12.88	12.99	13.87	13.87	15.40	15.51	15.51	15.51
10	2.22	3.23	4.53	5.56	6.46	7.44	7.53	9.12	12.64	12.76	13.62	13.62	15.13	15.24	15.24	15.24
20	2.20	3.22	4.44	5.45	6.37	7.33	7.44	8.95	12.42	12.53	13.27	13.38	14.86	14.98	14.98	14.98
30	2.17	3.11	4.36	5.35	6.28	7.24	7.35	8.79	12.20	12.32	13.14	13.17	14.61	14.74	14.74	14.74
40	2.12	3.11	4.28	5.26	6.20	7.14	7.26	8.64	12.01	12.13	12.95	12.96	14.38	14.51	14.51	14.51
50	2.09	3.04	4.21	5.18	6.12	7.06	7.17	8.51	11.83	11.96	12.76	12.78	14.16	14.30	14.31	14.31
60	2.07	2.99	4.15	5.10	6.05	6.97	7.09	8.38	11.66	11.79	12.58	12.59	13.96	14.11	14.11	14.11
70	2.04	2.97	4.09	5.02	5.98	6.89	7.02	8.26	11.50	11.64	12.33	12.43	13.77	13.92	13.93	13.93
100	1.98	2.86	3.92	4.82	5.80	6.67	6.81	7.94	11.08	11.22	11.96	12.01	13.27	13.43	13.44	13.44
200	1.74	2.58	3.36	4.37	5.33	6.13	6.27	7.13	10.03	10.21	10.86	10.87	12.03	12.24	12.27	12.27
500	1.51	2.33	3.01	3.79	4.73	5.44	5.59	5.90	8.35	8.67	9.03	9.56	10.05	10.48	10.61	10.61
1,000	1.47	2.08	2.62	3.28	4.22	4.85	5.07	5.37	7.16	7.49	7.83	8.47	8.64	9.23	9.39	9.39
5,000	0.94	1.22	1.64	2.00	2.57	2.92	3.36	3.62	4.78	5.32	5.58	6.16	6.33	6.62	6.79	6.79
10,000	0.69	0.92	1.27	1.61	1.91	2.14	2.49	2.65	3.76	4.29	4.41	4.95	5.20	5.41	5.59	5.59
20,000	0.27	0.59	0.86	1.05	1.30	1.43	1.70	1.92	2.55	3.15	3.21	3.67	3.94	3.97	4.25	4.25

Total area size = 35,273.4 sq-mi




Mass Curve - Storm #1009 - June 14-19, 1965
Holly, Colorado
Storm Center
Holly, CO
Latitude: 38.0441
Longitude: -102.1195
Accumulated Precipitation (inches)
0
2
4
6
8
10
12
14
16
18
1
6
11
16
21
26
31
36
41
46
51
56
61
66
71
76
81
86
91
96
101
106
111
116
121
126
131
136
141
Time (hours)


104°0'W
103°0'W
102°0'W
40°0'N
39°0'N
38°0'N
37°0'N
36°0'N
Total Storm Precipitation (inches)
Holly Storm Center, June 14-19, 1965
Based on PRISM June 1965 Total Precipitation
DAD Storm Center Zone
N
0 5 10 20
Miles
0 20 40 80
Kilometers
Precipitation (inches)
0.00 - 1.00
1.01 - 2.00
2.01 - 3.00
3.01 - 4.00
4.01 - 5.00
5.01 - 6.00
6.01 - 7.00
7.01 - 8.00
8.01 - 9.00
9.01 - 10.00
10.01 - 11.00
11.01 - 12.00
12.01 - 13.00
13.01 - 14.00
14.01 - 15.00
15.01 - 16.00

Ida Grove, IA August 30, 1962
Storm Type: Hybrid

Storm Name:	**Ida Grove, IA**
Storm Date:	**30-Aug-1962**
AWA Analysis Date:	**12/2/2008**

Storm Adjustment for Nebraska Grid Point 10

Temporal Transposition Date **15-Aug**

	Lat	Long
Storm center location	**42.35 N**	**95.47 W**
Storm Rep dew point location	**39.74 N**	**95.47 W**
Transposition dewpoint location	**38.14 N**	**97.0 W**
Basin location	**41.25 N**	**96.66 W**

Moisture Inflow Direction:	**S @ 180**	miles
Basin Elevation	**1,300**	feet
Storm Elevation	**1,200**	feet
Storm Duration	**24hr**	feet

The storm representative dew point is	**71.0 F**	with total precipitable water above sea level of			**2.36**	inches.
The in-place maximum dew point is	**79.0 F**	with total precipitable water above sea level of			**3.44**	inches.
The transpositioned maximum dew point is	**78.5 F**	with total precipitable water above sea level of			**3.37**	inches.
The in-place storm elevation is	**1,200**	which subtracts	**0.26**	inches of precipitable water at	**71.0 F**	
The in-place storm elevation is	**1,200**	which subtracts	**0.34**	inches of precipitable water at	**79.0 F**	
The transposition basin elevation at	**1,300**	which subtracts	**0.365**	inches of precipitable water at	**78.5 F**	
The inflow barrier/basin elevation height is	**1,300**	which subtracts	**0.365**	inches of precipitable water at	**78.5 F**	

The in-place storm maximization factor is	**1.48**
The transposition/elevation to basin factor is	**0.97**
The barrier adjustment factor is	**1.00**
The total adjustment factor is	**1.43**

Notes: DAD values taken from EPRI Storm Number 19

Observed Storm Depth-Area-Duration

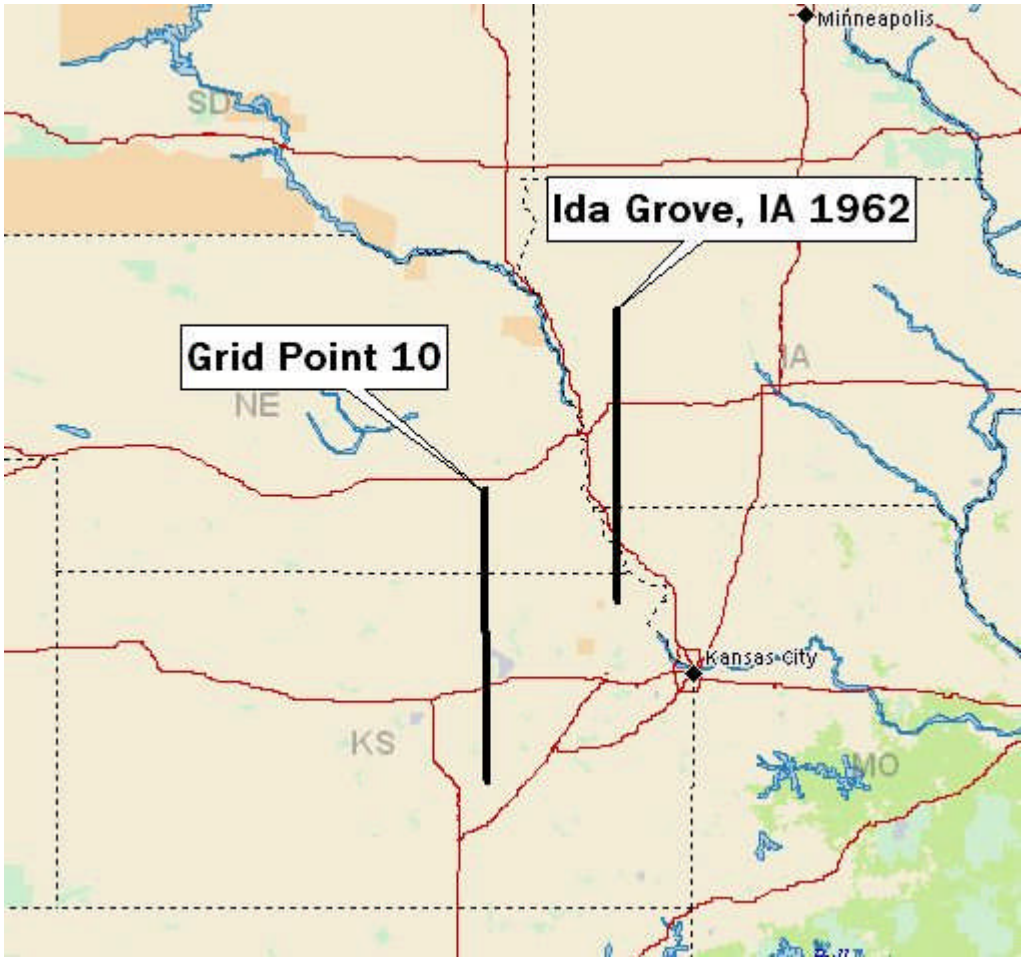
	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
100 sq miles	**5.7**	**8.0**	**0.0**	**12.2**	**0.0**	**12.9**	**0.0**	**0.0**	**0.0**
200 sq miles	**5.4**	**7.6**	**0.0**	**11.7**	**0.0**	**12.3**	**0.0**	**0.0**	**0.0**
500 sq miles	**4.8**	**7.0**	**0.0**	**10.8**	**0.0**	**11.3**	**0.0**	**0.0**	**0.0**
1000 sq miles	**4.2**	**6.3**	**0.0**	**9.8**	**0.0**	**10.3**	**0.0**	**0.0**	**0.0**
5000 sq miles	**2.6**	**4.3**	**0.0**	**7.0**	**0.0**	**7.6**	**0.0**	**0.0**	**0.0**
10000 sq miles	**2.1**	**3.5**	**0.0**	**5.8**	**0.0**	**6.6**	**0.0**	**0.0**	**0.0**
20000 sq miles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Adjusted Storm Depth-Area-Duration

	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
100 sq miles	**8.2**	**11.4**	**0.0**	**17.5**	**0.0**	**18.5**	**0.0**	**0.0**	**0.0**
200 sq miles	**7.7**	**10.9**	**0.0**	**16.7**	**0.0**	**17.6**	**0.0**	**0.0**	**0.0**
500 sq miles	**6.9**	**10.0**	**0.0**	**15.5**	**0.0**	**16.2**	**0.0**	**0.0**	**0.0**
1000 sq miles	**6.0**	**9.0**	**0.0**	**14.0**	**0.0**	**14.7**	**0.0**	**0.0**	**0.0**
5000 sq miles	**3.7**	**6.2**	**0.0**	**10.0**	**0.0**	**10.9**	**0.0**	**0.0**	**0.0**
10000 sq miles	**3.0**	**5.0**	**0.0**	**8.3**	**0.0**	**9.4**	**0.0**	**0.0**	**0.0**
20000 sq miles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Storm or Storm Center Name	**Ida Grove, IA**	
Storm Date(s)	30-Aug-1962	
Storm Type	Synoptic	
Storm Location	42.35 N	95.47 W
Storm Center Elevation	1,200	
Precipitation Total & Duration	12.85 Inches 48-hours EPRI Storm Number 19	
Storm Representative Dewpoint	71.0 F	24hr average
Storm Representative Dewpoint Location	39.74 N	95.47 W
Maximum Dewpoint	79.0 F	
Moisture Inflow Vector	S @ 180 Miles	
In-place Maximization Factor	1.48	
Temporal Transposition (Date)	15-Aug	
Transposition Dewpoint Location	38.14 N	97.0 W
Transposition Maximum Dewpoint	78.5 F	
Basin Elevation	1,300	
Transposition to Basin Adjustment Factor	0.97	
Higher of Basin Elevation - Inflow Barrier Height	1,300	
Elevation Adjustment Factor	1.00	
Total Adjustment Factor	1.43	

Ida Grove, IA August 30, 1962 Inflow



Ironwood, MI July 21, 1909
Storm Type: Synoptic

Storm Name:	**Ironwood, MI**
Storm Date:	**18-Jul-1909**
AWA Analysis Date:	**12/2/2008**

Storm Adjustment for Nebraska Grid Point 10

Temporal Transposition Date **15-Jul**

	Lat	Long
Storm center location	**47.35 N**	**95.80 W**
Storm Rep dew point location	**42.76 N**	**92.44 W**
Transposition dewpoint location	**37.05 N**	**99.08 W**
Basin location	**41.25 N**	**96.66 W**

Moisture Inflow Direction:	**SSW @ 275**	miles
Basin Elevation	**1,300**	feet
Storm Elevation	**1,500**	feet
Storm Duration	**24hr**	feet

The storm representative dew point is	**72.0 F**	with total precipitable water above sea level of			**2.47**	inches.
The in-place maximum dew point is	**79.5 F**	with total precipitable water above sea level of			**3.52**	inches.
The transpositioned maximum dew point is	**78.5 F**	with total precipitable water above sea level of			**3.37**	inches.
The in-place storm elevation is	**1,500**	which subtracts	**0.34**	inches of precipitable water at	**72.0 F**	
The in-place storm elevation is	**1,500**	which subtracts	**0.425**	inches of precipitable water at	**79.5 F**	
The transposition basin elevation at	**1,300**	which subtracts	**0.365**	inches of precipitable water at	**78.5 F**	
The inflow barrier/basin elevation height is	**1,300**	which subtracts	**0.365**	inches of precipitable water at	**78.5 F**	

The in-place storm maximization factor is	**1.45**
The transposition/elevation to basin factor is	**0.97**
The barrier adjustment factor is	**1.00**
The total adjustment factor is	**1.41**

Notes: DAD values taken from USACE UMV 1-11b

Observed Storm Depth-Area-Duration

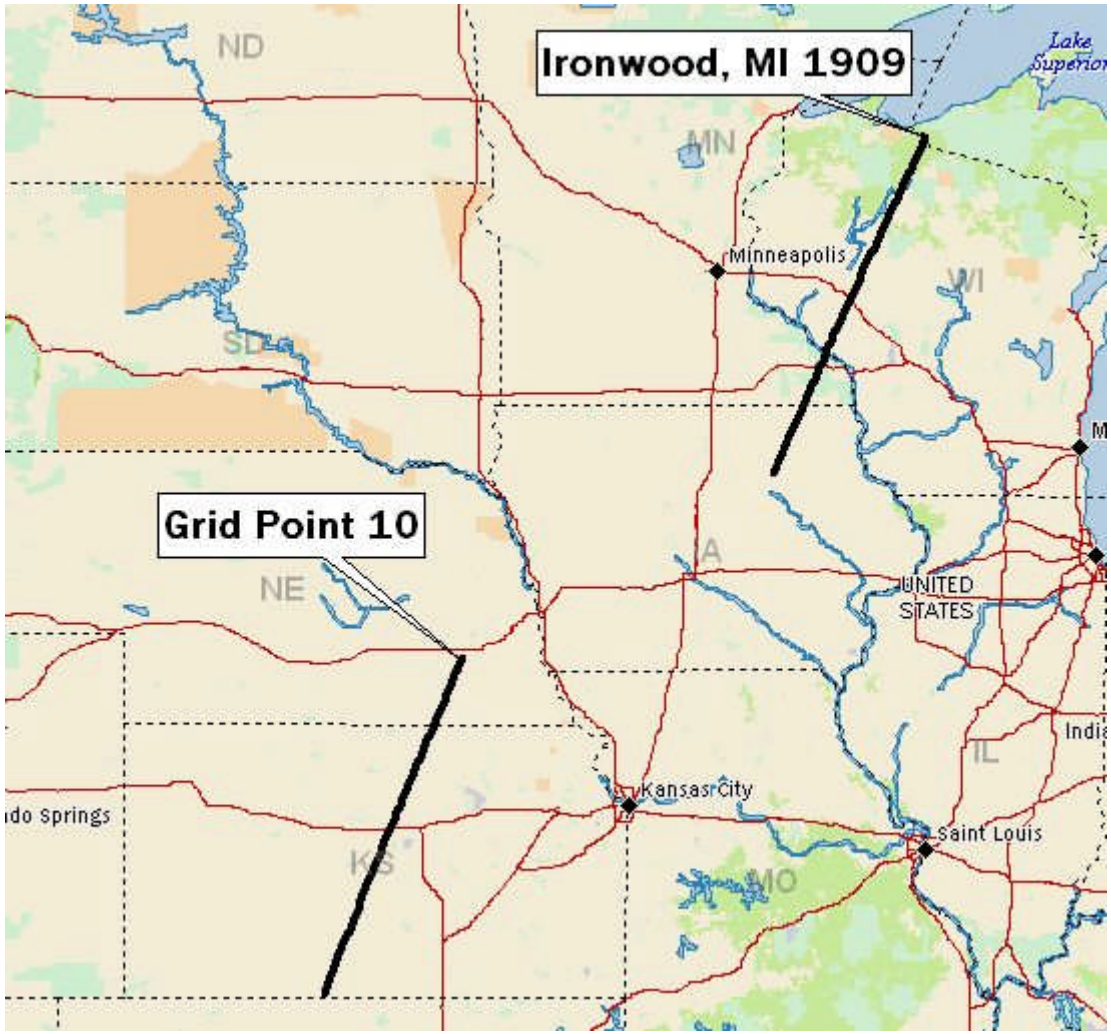
	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**5.2**	**6.3**	**6.7**	**9.6**	**11.1**	**11.7**	**12.1**	**12.8**	**13.2**
100 sq miles	**5.1**	**6.2**	**6.6**	**9.4**	**10.8**	**11.4**	**11.8**	**12.5**	**12.9**
200 sq miles	**4.6**	**6.0**	**6.3**	**9.0**	**10.5**	**11.1**	**11.5**	**12.1**	**12.5**
500 sq miles	**3.9**	**5.5**	**5.8**	**7.9**	**9.8**	**10.1**	**10.7**	**11.2**	**11.5**
1000 sq miles	**3.2**	**5.0**	**5.3**	**6.9**	**9.0**	**9.3**	**9.7**	**10.3**	**10.5**
5000 sq miles	**2.3**	**3.6**	**3.8**	**5.0**	**6.5**	**6.8**	**7.2**	**7.8**	**8.0**
10000 sq miles	**2.1**	**3.2**	**3.4**	**4.2**	**5.4**	**5.6**	**6.0**	**6.5**	**6.7**
20000 sq miles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Adjusted Storm Depth-Area-Duration

	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**7.3**	**8.9**	**9.5**	**13.5**	**15.7**	**16.5**	**17.1**	**18.1**	**18.6**
100 sq miles	**7.2**	**8.7**	**9.3**	**13.3**	**15.2**	**16.1**	**16.6**	**17.6**	**18.2**
200 sq miles	**6.5**	**8.5**	**8.9**	**12.7**	**14.8**	**15.7**	**16.2**	**17.1**	**17.6**
500 sq miles	**5.5**	**7.8**	**8.2**	**11.1**	**13.8**	**14.2**	**15.1**	**15.8**	**16.2**
1000 sq miles	**4.5**	**7.1**	**7.5**	**9.7**	**12.7**	**13.1**	**13.7**	**14.5**	**14.8**
5000 sq miles	**3.2**	**5.1**	**5.4**	**7.1**	**9.2**	**9.6**	**10.2**	**11.0**	**11.3**
10000 sq miles	**3.0**	**4.5**	**4.8**	**5.9**	**7.6**	**7.9**	**8.5**	**9.2**	**9.5**
20000 sq miles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

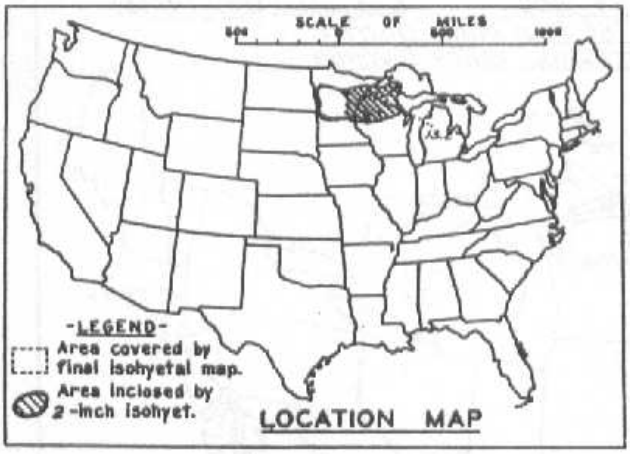
Storm or Storm Center Name	**Ironwood, MI**	
Storm Date(s)	18-Jul-1909	
Storm Type	Synoptic	
Storm Location	47.35 N	95.80 W
Storm Center Elevation	1,500	
Precipitation Total & Duration	13.20 Inches 72-hours USACE UMV 1-11b	
Storm Representative Dewpoint	72.0 F	24hr average
Storm Representative Dewpoint Location	42.76 N	92.44 W
Maximum Dewpoint	79.5 F	
Moisture Inflow Vector	SSW @ 275	
In-place Maximization Factor	1.45	
Temporal Transposition (Date)	15-Jul	
Transposition Dewpoint Location	37.05 N	99.08 W
Transposition Maximum Dewpoint	78.5 F	
Basin Elevation	1,300	
Transposition to Basin Adjustment Factor	0.97	
Higher of Basin Elevation - Inflow Barrier Height	1,300	
Elevation Adjustment Factor	1.00	
Total Adjustment Factor	1.41	

Ironwood, MI July 21, 1909 Inflow



DEPARTMENT OF THE ARMY — CORPS OF ENGINEERS

STORM STUDIES - PERTINENT DATA SHEET (REV.)



LOCATION MAP

Storm of 18-23 July 1909
Assignment HMV 1-11-(b)
Location Northern Minn. & Wis.
Study Prepared by:
Upper Mississippi Valley Division
St. Paul District Office

Part I Reviewed by H. M. Sec. of Weather Bureau, 6/7/39
Part II Approved by Office, Chief of Engineers for Distribution of Factual Data, 5/24/41
Remarks: Rainfall Data only for Ironwood, Mich. center Dewpt. 70° - Ref. Pt. 275 SSW Grid B-12

DATA AND COMPUTATIONS COMPILED

PART I

Preliminary isohyetal map, in 1 sheet, scale 1: 1,000,000

Precipitation data and mass curves:	(Number of Sheets)
Form 5001-C (Hourly precip. data)	4
Form 5001-B (24-hour " ")	-
Form 5001-D (" " " ")	8
Misc. precip. records, meteorological data, etc.	1
Form 5002 (Mass rainfall curves)	24

PART II

Final isohyetal maps, in 1 sheet, scale 1: 1,000,000

Data and computation sheets:

Form S-10 (Data from mass rainfall curves)	4
Form S-11 (Depth-area data from isohyetal map)	2
Form S-12 (Maximum depth-duration data)	8
Maximum duration-depth-area curves	2
Data relating to periods of maximum rainfall	2

MAXIMUM AVERAGE DEPTH OF RAINFALL IN INCHES

Area in Sq. Mi.	Duration of Rainfall in Hours										
	6	12	18	24	30	36	48	60	72	96	108
10	5.2	6.3	6.7	9.6	11.1	11.7	12.1	12.8	13.2	13.2	13.2
100	5.1	6.2	6.6	9.4	10.8	11.4	11.8	12.5	12.9	12.9	12.9
200	4.6	6.0	6.3	9.0	10.5	11.1	11.5	12.1	12.5	12.5	12.5
500	3.9	5.5	5.8	7.9	9.8	10.1	10.7	11.2	11.5	11.5	11.5
1,000	3.2	5.0	5.3	6.9	9.0	9.3	9.7	10.3	10.5	10.5	10.5
2,000	2.8	4.4	4.6	6.0	7.9	8.2	8.7	9.2	9.5	9.5	9.5
5,000	2.3	3.6	3.8	5.0	6.5	6.8	7.2	7.8	8.0	8.0	8.0
10,000	2.1	3.2	3.4	4.2	5.4	5.6	6.0	6.5	6.7	6.9	6.9

Form S-2

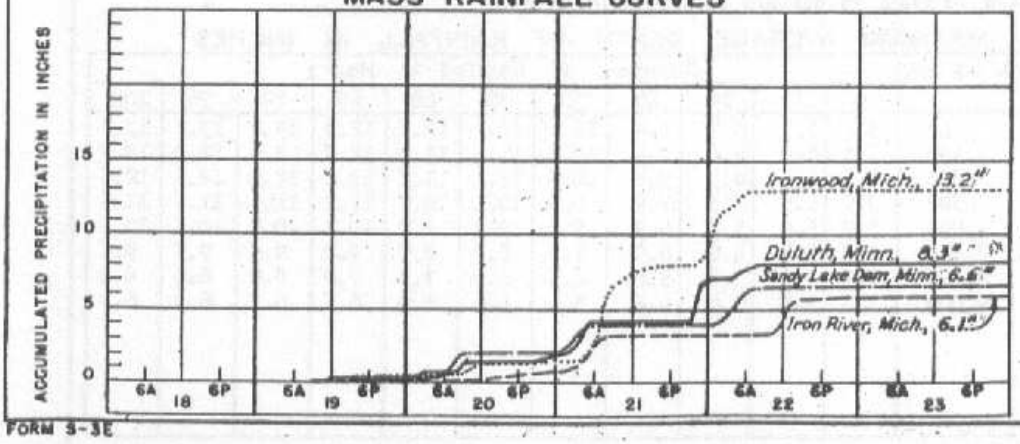
DEPARTMENT OF THE ARMY — CORPS OF ENGINEERS

STORM STUDIES – ISOHYETAL MAP

Storm of July 18-23, 1909 Assignment UMV 1-11 (b)

Study Prepared by: St. Paul, Minn. District
Upper Mississippi Valley Division

MASS RAINFALL CURVES



FORM 3-3E

Lambert, MN July 18, 1897
Storm Type: Synoptic

Storm Name:	**Lambert, MN**
Storm Date:	**7/18/1897**
AWA Analysis Date:	**12/2/2008**

Storm Adjustment for Nebraska Grid Point 10

Temporal Transposition Date **15-Jul**

	Lat	Long
Storm center location	**44.23 N**	**95.26 W**
Storm Rep dew point location	**40.20 N**	**93.09 W**
Transposition dewpoint location	**36.72 N**	**94.83 W**
Basin location	**41.25 N**	**96.66 W**

Moisture Inflow Direction:	**SSE @ 300**	miles
Basin Elevation	**1,300**	feet
Storm Elevation	**1,500**	feet
Storm Duration	**24hr**	feet

The storm representative dew point is	**71.0 F**	with total precipitable water above sea level of			**2.36**	inches.
The in-place maximum dew point is	**80.0 F**	with total precipitable water above sea level of			**3.60**	inches.
The transpositioned maximum dew point is	**79.5 F**	with total precipitable water above sea level of			**3.52**	inches.
The in-place storm elevation is	**1,500**	which subtracts	**0.32**	inches of precipitable water at	**71.0 F**	
The in-place storm elevation is	**1,500**	which subtracts	**0.43**	inches of precipitable water at	**80.0 F**	
The transposition basin elevation at	**1,300**	which subtracts	**0.375**	inches of precipitable water at	**79.5 F**	
The inflow barrier/basin elevation height is	**1,300**	which subtracts	**0.375**	inches of precipitable water at	**79.5 F**	

The in-place storm maximization factor is	**1.50**
The transposition/elevation to basin factor is	**0.99**
The barrier adjustment factor is	**1.00**
The total adjustment factor is	**1.49**

Notes: DAD values taken from USACE UMV 1-2. In-place maximization factor of 1.55, although a factor of 1.50 was adopted as the upper limit for this study through guidance from HMRs 55A and 51.

Observed Storm Depth-Area-Duration

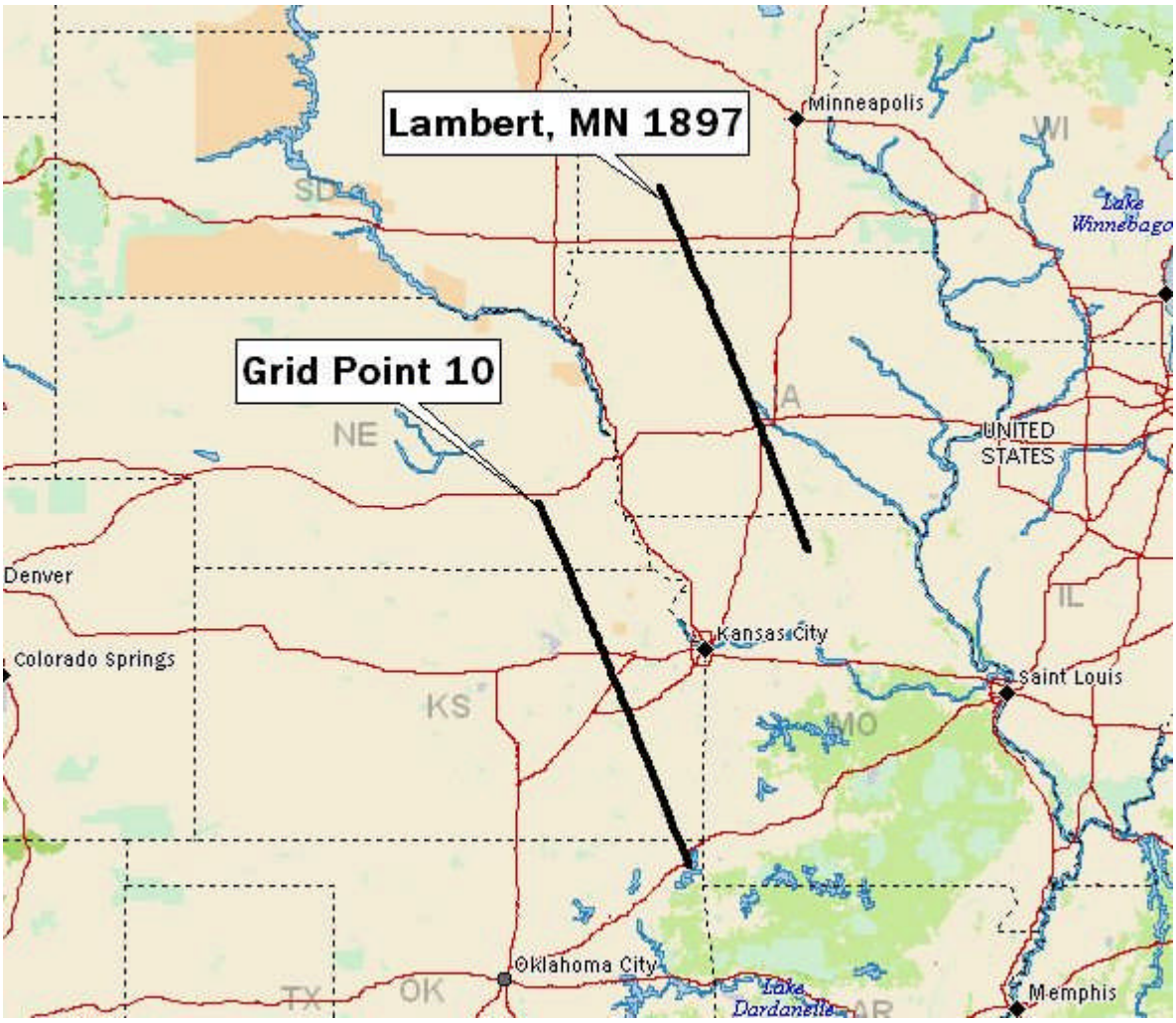
	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**3.2**	**5.2**	**6.2**	**6.5**	**6.5**	**6.5**	**6.9**	**8.0**	**8.0**
100 sq miles	**3.1**	**4.8**	**6.0**	**6.3**	**6.3**	**6.3**	**6.8**	**7.9**	**7.9**
200 sq miles	**3.0**	**4.6**	**5.9**	**6.2**	**6.2**	**6.2**	**6.7**	**7.8**	**7.8**
500 sq miles	**2.9**	**4.4**	**5.7**	**6.0**	**6.0**	**6.0**	**6.5**	**7.6**	**7.6**
1000 sq miles	**2.7**	**4.2**	**5.5**	**5.8**	**5.8**	**5.8**	**6.3**	**7.3**	**7.3**
5000 sq miles	**2.3**	**3.4**	**4.3**	**4.5**	**4.7**	**4.7**	**5.2**	**6.1**	**6.2**
10000 sq miles	**1.9**	**3.0**	**3.8**	**4.0**	**4.2**	**4.2**	**4.5**	**5.4**	**5.5**
20000 sq miles	**1.7**	**2.8**	**3.5**	**3.7**	**3.8**	**3.8**	**4.2**	**4.8**	**5.0**

Adjusted Storm Depth-Area-Duration

	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**4.8**	**7.7**	**9.2**	**9.7**	**9.7**	**9.7**	**10.3**	**11.9**	**11.9**
100 sq miles	**4.6**	**7.1**	**8.9**	**9.4**	**9.4**	**9.4**	**10.1**	**11.8**	**11.8**
200 sq miles	**4.5**	**6.8**	**8.8**	**9.2**	**9.2**	**9.2**	**10.0**	**11.6**	**11.6**
500 sq miles	**4.3**	**6.5**	**8.5**	**8.9**	**8.9**	**8.9**	**9.7**	**11.3**	**11.3**
1000 sq miles	**4.0**	**6.3**	**8.2**	**8.6**	**8.6**	**8.6**	**9.4**	**10.9**	**10.9**
5000 sq miles	**3.4**	**5.1**	**6.4**	**6.7**	**7.0**	**7.0**	**7.7**	**9.1**	**9.2**
10000 sq miles	**2.8**	**4.5**	**5.7**	**6.0**	**6.3**	**6.3**	**6.7**	**8.0**	**8.2**
20000 sq miles	**2.5**	**4.2**	**5.2**	**5.5**	**5.7**	**5.7**	**6.3**	**7.1**	**7.4**

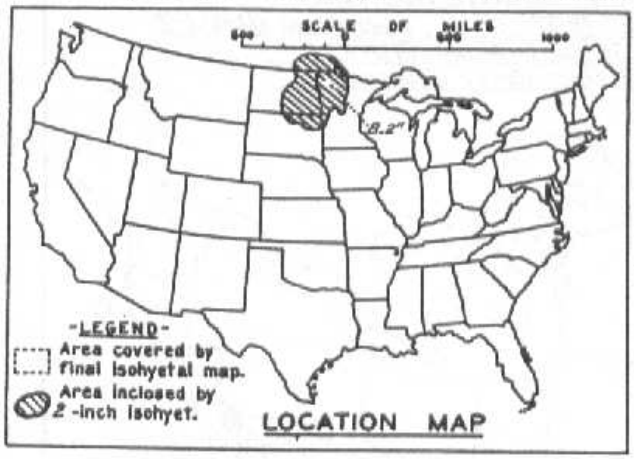
Storm or Storm Center Name	**Lambert, MN**
Storm Date(s)	7/18/1897
Storm Type	Synoptic
Storm Location	44.23 N 95.26 W
Storm Center Elevation	1,500
Precipitation Total & Duration	8.00 Inches 72-hours USACE UMV 1-2
Storm Representative Dewpoint	71.0 F 24hr average
Storm Representative Dewpoint Location	40.20 N 93.09 W
Maximum Dewpoint	80.0 F
Moisture Inflow Vector	SSE @ 300
In-place Maximization Factor	1.50
Temporal Transposition (Date)	15-Jul
Transposition Dewpoint Location	36.72 N 94.83 W
Transposition Maximum Dewpoint	79.5 F
Basin Elevation	1,300
Transposition to Basin Adjustment Factor	0.99
Higher of Basin Elevation - Inflow Barrier Height	1,300
Elevation Adjustment Factor	1.00
Total Adjustment Factor	1.49

Lambert, MN July 18, 1897 Inflow



DEPARTMENT OF THE ARMY — CORPS OF ENGINEERS

STORM STUDIES - PERTINENT DATA SHEET (REV.)



LOCATION MAP

Storm of 18 - 22 July 1897
Assignment UMV 1-2
Location Minn. and N. D.
Study Prepared by:
Upper Mississippi Valley Division
St. Paul District Office

Part I Reviewed by H. M. Sec. of Weather Bureau, 12-7-40
Part II Approved by Office, Chief of Engineers for Distribution of Factual Data, 7-19-45
Remarks: Center at:
Lambert, Minn.
Dewpt. 65° - Ref. Pt. 300 S
Grid A-16

DATA AND COMPUTATIONS COMPILED

PART I

Preliminary isohyetal map, in 1 sheet, scale 1: 1,000,000

Precipitation data and mass curves: (Number of Sheets)

Form 5001-C (Hourly precip. data)	4
Form 5001-B (24-hour " ")	-
Form 5001-D (" " " ")	5
Misc. precip. records, meteorological data, etc.	6
Form 5002 (Mass rainfall curves)	13

PART II

Final isohyetal maps, in 1 sheet, scale 1: 1,000,000

Data and computation sheets:

Form S-10 (Data from mass rainfall curves)	2
Form S-11 (Depth-area data from isohyetal map)	1
Form S-12 (Maximum depth-duration data)	9
Maximum duration-depth-area curves	1
Data relating to periods of maximum rainfall	2

MAXIMUM AVERAGE DEPTH OF RAINFALL IN INCHES

Area in Sq. Mi.	Duration of Rainfall in Hours										
	6	12	18	24	30	36	48	60	72	96	102
10	3.2	5.2	6.2	6.5	6.5	6.5	6.9	8.0	8.0	8.2	8.2
100	3.1	4.8	6.0	6.3	6.3	6.3	6.8	7.9	7.9	8.2	8.2
200	3.0	4.6	5.9	6.2	6.2	6.2	6.7	7.8	7.8	8.1	8.1
500	2.9	4.4	5.7	6.0	6.0	6.0	6.5	7.6	7.6	7.9	7.9
1,000	2.7	4.2	5.5	5.8	5.8	5.8	6.3	7.3	7.3	7.6	7.6
2,000	2.6	3.9	5.1	5.4	5.5	5.5	5.9	6.9	6.9	7.2	7.2
5,000	2.3	3.4	4.3	4.5	4.7	4.7	5.2	6.1	6.2	6.4	6.4
10,000	1.9	3.0	3.8	4.0	4.2	4.2	4.5	5.4	5.5	5.7	5.7
20,000	1.7	2.8	3.5	3.7	3.8	3.8	4.2	4.8	5.0	5.3	5.3
50,000	1.3	2.3	2.9	3.1	3.3	3.4	3.7	3.9	4.1	4.6	4.6
80,000	1.1	1.7	2.2	2.3	2.8	2.8	3.1	3.3	3.5	3.8	3.8

Form S-2

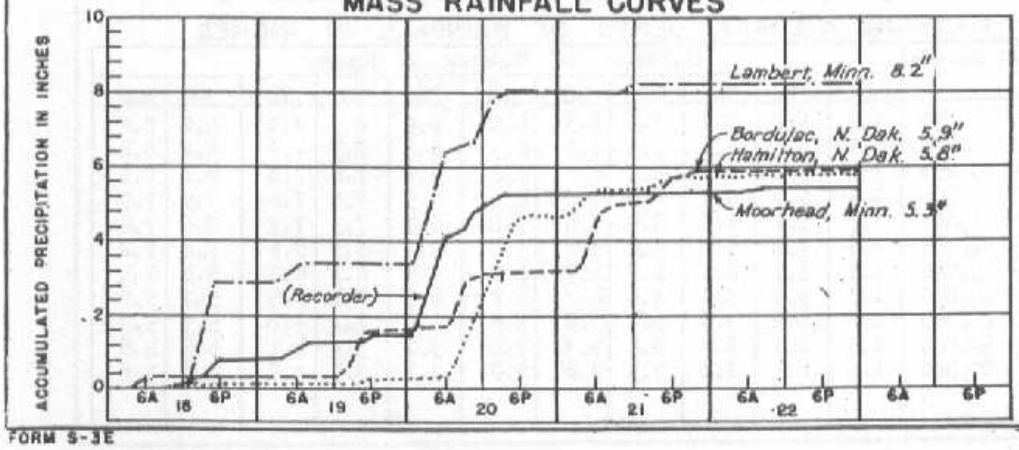
DEPARTMENT OF THE ARMY — CORPS OF ENGINEERS

STORM STUDIES – ISOHYETAL MAP

Storm of July 18-22, 1897 Assignment UMV 1-2

Study Prepared by: St. Paul, Minn. District
Upper Mississippi Valley Division

MASS RAINFALL CURVES



FORM S-3E

Medford, WI June 4, 1905
Storm Type: Synoptic

Storm Name:	**Medford, WI**
Storm Date:	**03-Jun-1905**
AWA Analysis Date:	**12/2/2008**

Storm Adjustment for Nebraska Grid Point 10

Temporal Transposition Date **15-Jun**

	Lat	Long
Storm center location	**45.14 N**	**90.34 W**
Storm Rep dew point location	**43.06 N**	**93.14 W**
Transposition dewpoint location	**38.67 N**	**99.80 W**
Basin location	**41.25 N**	**96.66 W**

Moisture Inflow Direction:	**SW @ 200**	miles
Basin Elevation	**1,300**	feet
Storm Elevation	**1,500**	feet
Storm Duration	**24hr**	feet

The storm representative dew point is	**70.0 F**	with total precipitable water above sea level of			**2.25**	inches.
The in-place maximum dew point is	**76.5 F**	with total precipitable water above sea level of			**3.07**	inches.
The transpositioned maximum dew point is	**76.5 F**	with total precipitable water above sea level of			**3.07**	inches.
The in-place storm elevation is	**1,500**	which subtracts	**0.31**	inches of precipitable water at	**70.0 F**	
The in-place storm elevation is	**1,500**	which subtracts	**0.385**	inches of precipitable water at	**76.5 F**	
The transposition basin elevation at	**1,300**	which subtracts	**0.335**	inches of precipitable water at	**76.5 F**	
The inflow barrier/basin elevation height is	**1,300**	which subtracts	**0.335**	inches of precipitable water at	**76.5 F**	

The in-place storm maximization factor is	**1.38**
The transposition/elevation to basin factor is	**1.02**
The barrier adjustment factor is	**1.00**
The total adjustment factor is	**1.41**

Notes: DAD values taken from USACE GL 2-12

Observed Storm Depth-Area-Duration

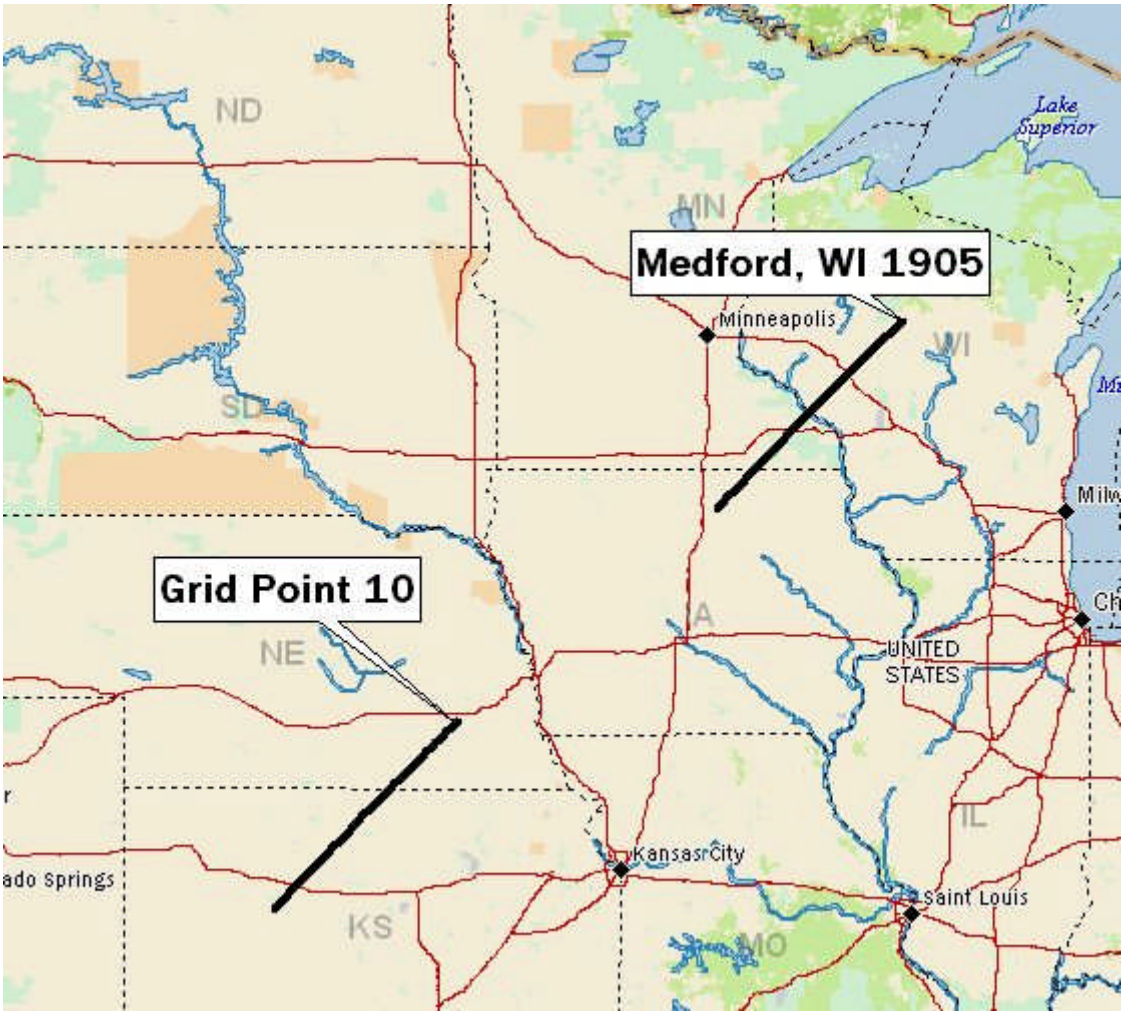
	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**7.2**	**8.4**	**8.5**	**8.9**	**9.1**	**9.9**	**10.5**	**11.2**	**11.2**
100 sq miles	**6.8**	**8.1**	**8.3**	**8.5**	**8.7**	**9.6**	**10.1**	**10.7**	**10.7**
200 sq miles	**6.6**	**7.8**	**8.0**	**8.2**	**8.5**	**9.2**	**9.9**	**10.5**	**10.5**
500 sq miles	**6.0**	**7.0**	**7.1**	**7.6**	**8.1**	**8.6**	**9.3**	**9.9**	**9.9**
1000 sq miles	**5.4**	**6.2**	**6.4**	**7.0**	**7.6**	**8.0**	**8.7**	**9.3**	**9.3**
5000 sq miles	**3.8**	**4.5**	**4.8**	**5.5**	**6.1**	**6.5**	**7.0**	**7.6**	**7.7**
10000 sq miles	**3.1**	**3.8**	**4.0**	**4.8**	**5.4**	**5.8**	**6.2**	**6.9**	**7.0**
20000 sq miles	**2.4**	**3.0**	**3.3**	**4.1**	**4.8**	**5.1**	**5.3**	**6.1**	**6.2**

Adjusted Storm Depth-Area-Duration

	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**10.2**	**11.8**	**12.0**	**12.5**	**12.8**	**14.0**	**14.8**	**15.8**	**15.8**
100 sq miles	**9.6**	**11.4**	**11.7**	**12.0**	**12.3**	**13.5**	**14.2**	**15.1**	**15.1**
200 sq miles	**9.3**	**11.0**	**11.3**	**11.6**	**12.0**	**13.0**	**14.0**	**14.8**	**14.8**
500 sq miles	**8.5**	**9.9**	**10.0**	**10.7**	**11.4**	**12.1**	**13.1**	**14.0**	**14.0**
1000 sq miles	**7.6**	**8.7**	**9.0**	**9.9**	**10.7**	**11.3**	**12.3**	**13.1**	**13.1**
5000 sq miles	**5.4**	**6.3**	**6.8**	**7.8**	**8.6**	**9.2**	**9.9**	**10.7**	**10.9**
10000 sq miles	**4.4**	**5.4**	**5.6**	**6.8**	**7.6**	**8.2**	**8.7**	**9.7**	**9.9**
20000 sq miles	**3.4**	**4.2**	**4.7**	**5.8**	**6.8**	**7.2**	**7.5**	**8.6**	**8.7**

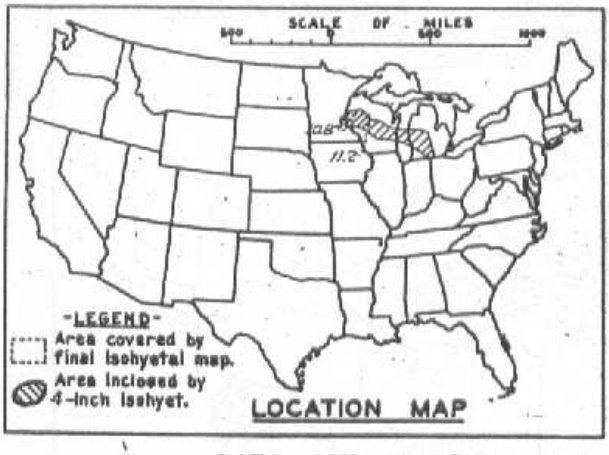
Storm or Storm Center Name	**Medford, WI**
Storm Date(s)	3-Jun-1905
Storm Type	Synoptic
Storm Location	45.14 N 90.34 W
Storm Center Elevation	1,500
Precipitation Total & Duration	11.20 Inches 72-hours USACE GL 2-12
Storm Representative Dewpoint	70.0 F 24hr average
Storm Representative Dewpoint Location	43.06 N 93.14 W
Maximum Dewpoint	76.5 F
Moisture Inflow Vector	SW @ 200 Miles
In-place Maximization Factor	1.38
Temporal Transposition (Date)	15-Jun
Transposition Dewpoint Location	38.67 N 99.80 W
Transposition Maximum Dewpoint	76.5 F
Basin Elevation	1,300
Transposition to Basin Adjustment Factor	1.02
Higher of Basin Elevation - Inflow Barrier Height	1,300
Elevation Adjustment Factor	1.00
Total Adjustment Factor	1.41

Medford, WI June 4, 1905 Inflow



WAR DEPARTMENT — CORPS OF ENGINEERS, U. S. ARMY

STORM STUDIES - PERTINENT DATA SHEET



LOCATION MAP

Storm of 3-8 June 1905
Assignment G L 2 - 12
Location Minn., Wis., Mich., Ohio
Study Prepared by:
Great Lakes Division
Milwaukee District Office

Part I Reviewed by H. M. Sec. of Weather Bureau, 6-17-40
Part II Approved by Office, Chief of Engineers for Distribution of Factual Data, 12-6-45
Remarks: Centers at Medford and Barron, Wis.

DATA AND COMPUTATIONS COMPILED

PART I

Preliminary isohyetal map, in 1 sheet, scale 1:2,500,000

Precipitation data and mass curves:	(Number of Sheets)
Form 5001-C (Hourly precip. data)	16
Form 5001-B (24-hour " ")	—
Form 5001-D (" " " ")	10
Misc. precip. records, meteorological data, etc.	20
Form 5002 (Mass rainfall curves)	29

PART II

Final isohyetal maps, in 1 sheet, scale 1:1,000,000

Data and computation sheets:	
Form S-10 (Data from mass rainfall curves)	4
Form S-11 (Depth-area data from isohyetal map)	2
Form S-12 (Maximum depth-duration data)	8
Maximum duration-depth-area curves	1
Data relating to periods of maximum rainfall	2

MAXIMUM AVERAGE DEPTH OF RAINFALL IN INCHES

Area in Sq. Mi.	Duration of Rainfall in Hours										
	6	12	18	24	30	36	48	60	72	96	120
10	7.2	8.4	8.5	8.9	9.1	9.9	10.5	11.2	11.2	11.2	11.2
100	6.8	8.1	8.3	8.5	8.7	9.6	10.1	10.7	10.7	10.7	10.7
200	6.6	7.8	8.0	8.2	8.5	9.2	9.9	10.5	10.5	10.5	10.5
500	6.0	7.0	7.1	7.6	8.1	8.6	9.3	9.9	9.9	9.9	9.9
1,000	5.4	6.2	6.4	7.0	7.6	8.0	8.7	9.3	9.3	9.3	9.3
2,000	4.7	5.5	5.7	6.4	7.0	7.4	8.0	8.6	8.6	8.7	8.7
5,000	3.8	4.5	4.8	5.5	6.1	6.5	7.0	7.6	7.7	7.8	7.8
10,000	3.1	3.8	4.0	4.8	5.4	5.8	6.2	6.9	7.0	7.1	7.1
20,000	2.4	3.0	3.3	4.1	4.8	5.1	5.3	6.1	6.2	6.3	6.3
50,000	1.5	2.1	2.4	2.9	3.5	3.6	4.0	4.5	4.7	4.8	4.8
67,000	1.2	1.8	2.1	2.4	3.0	3.1	3.3	3.8	4.0	4.2	4.2

Form S-2

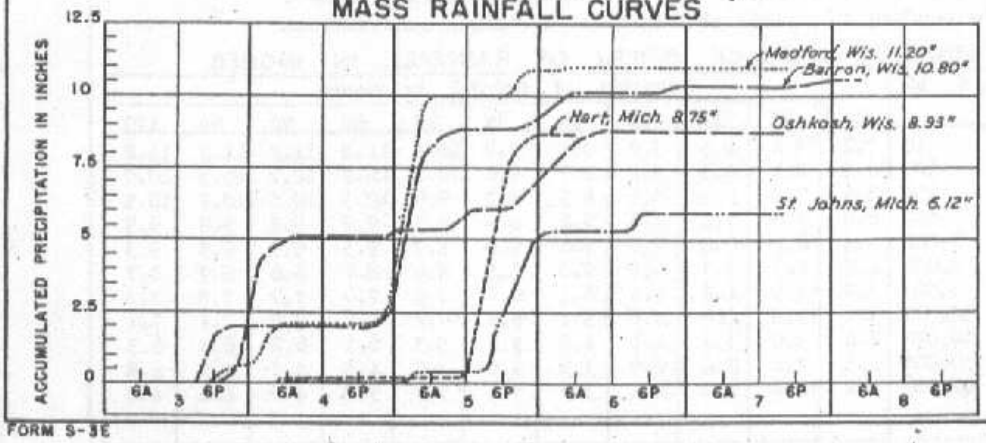
WAR DEPARTMENT — CORPS OF ENGINEERS, U. S. ARMY

STORM STUDIES – ISOHYETAL MAP

Storm of June 3-8, 1905 Assignment GL 2-12

Study Prepared by: Milwaukee, Wis. District
Great Lakes Division

MASS RAINFALL CURVES



FORM S-3E

Meeker, OK October 19, 1908
Storm Type: Hybrid

Storm Name:	**Meeker, OK**
Storm Date:	**19-Oct-1908**
AWA Analysis Date:	**12/2/2008**

Storm Adjustment for Nebraska Grid Point 5

Temporal Transposition Date **4-Oct**

	Lat	Long
Storm center location	**35.50 N**	**96.90 W**
Storm Rep dew point location	**33.43 N**	**94.45 W**
Transposition dewpoint location	**37.18 N**	**92.55 W**
Basin location	**41.25 N**	**96.66 W**

Moisture Inflow Direction:	**SE @ 200**	miles
Basin Elevation	**1,300**	feet
Storm Elevation	**900**	feet
Storm Duration	**24hr**	feet

The storm representative dew point is	**68.0 F**	with total precipitable water above sea level of			**2.05**	inches.
The in-place maximum dew point is	**75.5 F**	with total precipitable water above sea level of			**2.92**	inches.
The transpositioned maximum dew point is	**73.5 F**	with total precipitable water above sea level of			**2.67**	inches.
The in-place storm elevation is	**900**	which subtracts	**0.18**	inches of precipitable water at	**68.0 F**	
The in-place storm elevation is	**900**	which subtracts	**0.23**	inches of precipitable water at	**75.5 F**	
The transposition basin elevation at	**1,300**	which subtracts	**0.215**	inches of precipitable water at	**73.5 F**	
The inflow barrier/basin elevation height is	**1,300**	which subtracts	**0.215**	inches of precipitable water at	**73.5 F**	

The in-place storm maximization factor is	**1.44**
The transposition/elevation to basin factor is	**0.91**
The barrier adjustment factor is	**1.00**
The total adjustment factor is	**1.31**

Notes: DAD values taken from USACE Storm Studies SW 1-11

Observed Storm Depth-Area-Duration

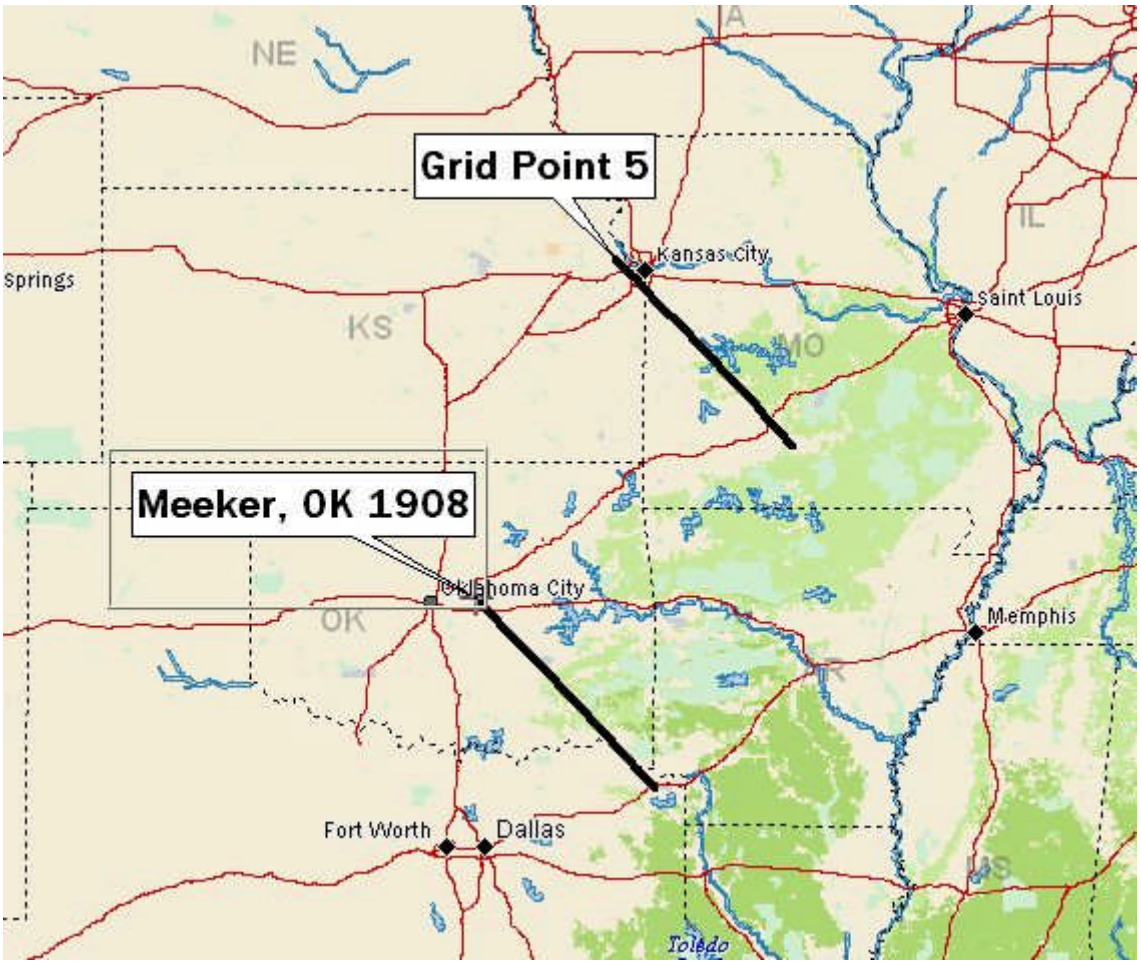
	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**9.4**	**10.0**	**10.0**	**11.4**	**11.8**	**12.0**	**14.5**	**14.9**	**15.2**
100 sq miles	**8.2**	**9.3**	**9.4**	**10.3**	**11.3**	**11.5**	**13.6**	**14.4**	**14.9**
200 sq miles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
500 sq miles	**7.1**	**8.4**	**8.5**	**9.2**	**10.5**	**10.7**	**13.2**	**13.8**	**14.2**
1000 sq miles	**6.3**	**7.5**	**7.7**	**8.6**	**9.9**	**10.2**	**12.7**	**13.3**	**13.7**
5000 sq miles	**4.4**	**5.4**	**5.7**	**6.6**	**7.6**	**8.2**	**10.5**	**11.3**	**11.7**
10000 sq miles	**3.5**	**4.5**	**4.8**	**5.6**	**6.4**	**7.1**	**9.2**	**10.0**	**10.6**
20000 sq miles	**2.7**	**3.6**	**3.9**	**4.6**	**5.3**	**5.9**	**7.7**	**8.6**	**9.0**

Adjusted Storm Depth-Area-Duration

	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**12.3**	**13.1**	**13.1**	**15.0**	**15.5**	**15.8**	**19.0**	**19.6**	**20.0**
100 sq miles	**10.8**	**12.2**	**12.3**	**13.5**	**14.8**	**15.1**	**17.9**	**18.9**	**19.6**
200 sq miles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
500 sq miles	**9.3**	**11.0**	**11.2**	**12.1**	**13.8**	**14.0**	**17.3**	**18.1**	**18.6**
1000 sq miles	**8.3**	**9.8**	**10.1**	**11.3**	**13.0**	**13.4**	**16.7**	**17.5**	**18.0**
5000 sq miles	**5.8**	**7.1**	**7.5**	**8.7**	**10.0**	**10.8**	**13.8**	**14.8**	**15.4**
10000 sq miles	**4.6**	**5.9**	**6.3**	**7.4**	**8.4**	**9.3**	**12.1**	**13.1**	**13.9**
20000 sq miles	**3.5**	**4.7**	**5.1**	**6.0**	**7.0**	**7.7**	**10.1**	**11.3**	**11.8**

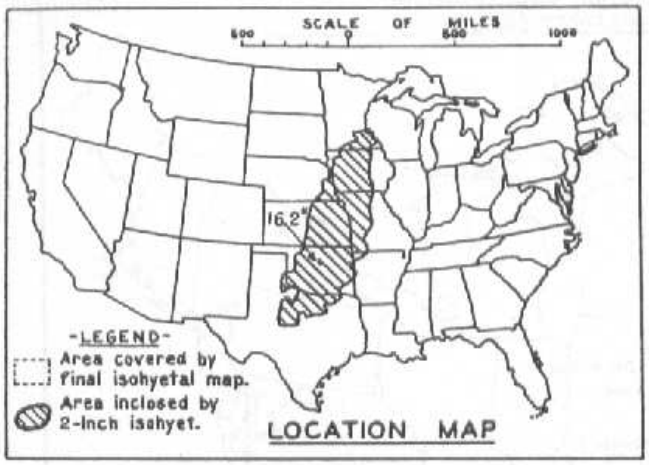
Storm or Storm Center Name	**Meeker, OK**	
Storm Date(s)	19-Oct-1908	
Storm Type	Synoptic	
Storm Location	35.50 N	96.90 W
Storm Center Elevation	900	
Precipitation Total & Duration	16.23 Inches 126-hours USACE Storm Studies SW 1-11	
Storm Representative Dewpoint	68.0 F	24hr average
Storm Representative Dewpoint Location	33.43 N	94.45 W
Maximum Dewpoint	75.5 F	
Moisture Inflow Vector	SE @ 200 Miles	
In-place Maximization Factor	1.44	
Temporal Transposition (Date)	4-Oct	
Transposition Dewpoint Location	37.18 N	92.55 W
Transposition Maximum Dewpoint	73.5 F	
Basin Elevation	1,300	
Transposition to Basin Adjustment Factor	0.91	
Higher of Basin Elevation - Inflow Barrier Height	1,300	
Elevation Adjustment Factor	1.00	
Total Adjustment Factor	1.31	

Meeker, OK October 19, 1908 Inflow



WAR DEPARTMENT CORPS OF ENGINEERS, U. S. ARMY

STORM STUDIES – PERTINENT DATA SHEET



LOCATION MAP

Storm of October 19-24, 1908
Assignment S W 1 - 11
Location Okla., Tex.,-Ia.
Study Prepared by:

Southwestern Division
Tulsa District Office

Part I Reviewed by H. M. Sec. of Weather Bureau, 11-12-40
Part II Approved by Office, Chief of Engineers for Distribution of Factual Data, 7-15-45
Remarks: Center at:

Keeker, Okla.

DATA AND COMPUTATIONS COMPILED

PART I

Preliminary isohyetal map, in 2 sheets, scale 1:2,500,000

Precipitation data and mass curves: (Number of Sheets)

Form 5001-C (Hourly precip. data)	22
Form 5001-B (24-hour " ")	—
Form 5001-D (" " " ")	28
Miscl. precip. records, meteorological data, etc.	—
Form 5002 (Mass rainfall curves)	35

PART II

Final isohyetal maps, in 1 sheet, scale 1:1,000,000

Data and computation sheets:

Form S-10 (Data from mass rainfall curves)	10
Form S-11 (Depth-area data from isohyetal map)	2
Form S-12 (Maximum depth-duration data)	11
Maximum duration-depth-area curves	1
Data relating to periods of maximum rainfall	2

MAXIMUM AVERAGE DEPTH OF RAINFALL IN INCHES

Area in Sq. Mi.	Duration of Rainfall in Hours										
	6	12	18	24	30	36	48	60	72	90	126
10	9.4	10.0	10.0	11.4	11.8	12.0	14.5	14.9	15.2	15.8	16.2
100	8.2	9.3	9.4	10.3	11.3	11.5	13.6	14.4	14.9	15.4	15.9
500	7.1	8.4	8.5	9.2	10.5	10.7	13.2	13.8	14.2	14.6	15.1
1,000	6.3	7.5	7.7	8.6	9.9	10.2	12.7	13.3	13.7	14.0	14.5
2,000	5.5	6.6	6.8	7.8	9.0	9.4	11.9	12.5	12.9	13.3	13.7
5,000	4.4	5.4	5.7	6.6	7.6	8.2	10.5	11.3	11.7	12.1	12.5
10,000	3.5	4.5	4.8	5.6	6.4	7.1	9.2	10.0	10.6	11.0	11.4
20,000	2.7	3.6	3.9	4.6	5.3	5.9	7.7	8.6	9.0	9.6	10.1
50,000	1.6	2.4	2.8	3.4	3.8	4.3	5.6	6.2	6.6	7.2	8.0
80,000	1.0	1.7	2.1	2.7	3.0	3.4	4.4	4.9	5.4	5.9	6.8

Form S-2

870668 O - 45 - 7

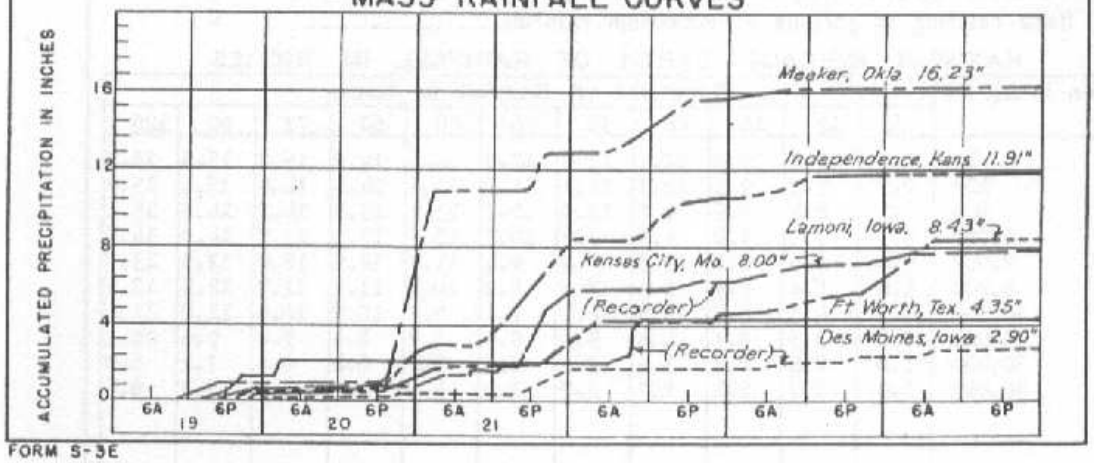
WAR DEPARTMENT — CORPS OF ENGINEERS, U. S. ARMY

STORM STUDIES - ISOHYETAL MAP

Storm of October 19-24, 1908 Assignment SW 1-11

Study Prepared by: Tulsa, Okla. District
Southwestern Division

MASS RAINFALL CURVES



FORM S-3E

Minneapolis, MN July 23, 1987
Storm Type: MCC

Storm Name:	**Minneapolis, MN**
Storm Date:	**23-Jul-1987**
AWA Analysis Date:	**12/2/2008**

Storm Adjustment for Nebraska Grid Point 10

Temporal Transposition Date **15-Jul**

	Lat	Long
Storm center location	**44.97 N**	**93.28 W**
Storm Rep dew point location	**44.46 N**	**94.90 W**
Transposition dewpoint location	**40.24 N**	**98.62 W**
Basin location	**41.25 N**	**96.66 W**

Moisture Inflow Direction:	**WSW @ 90**	miles
Basin Elevation	**1,300**	feet
Storm Elevation	**850**	feet
Storm Duration	**6hr**	feet

The storm representative dew point is	**78.0 F**	with total precipitable water above sea level of			**3.29**	inches.
The in-place maximum dew point is	**82.5 F**	with total precipitable water above sea level of			**4.00**	inches.
The transpositioned maximum dew point is	**83.0 F**	with total precipitable water above sea level of			**4.08**	inches.
The in-place storm elevation is	**850**	which subtracts	**0.235**	inches of precipitable water at	**78.0 F**	
The in-place storm elevation is	**850**	which subtracts	**0.28**	inches of precipitable water at	**82.5 F**	
The transposition basin elevation at	**1,300**	which subtracts	**0.41**	inches of precipitable water at	**83.0 F**	
The inflow barrier/basin elevation height is	**1,300**	which subtracts	**0.41**	inches of precipitable water at	**83.0 F**	

The in-place storm maximization factor is	**1.22**
The transposition/elevation to basin factor is	**0.99**
The barrier adjustment factor is	**1.00**
The total adjustment factor is	**1.20**

Notes: DAD values taken from EPRI Storm 23

Observed Storm Depth-Area-Duration

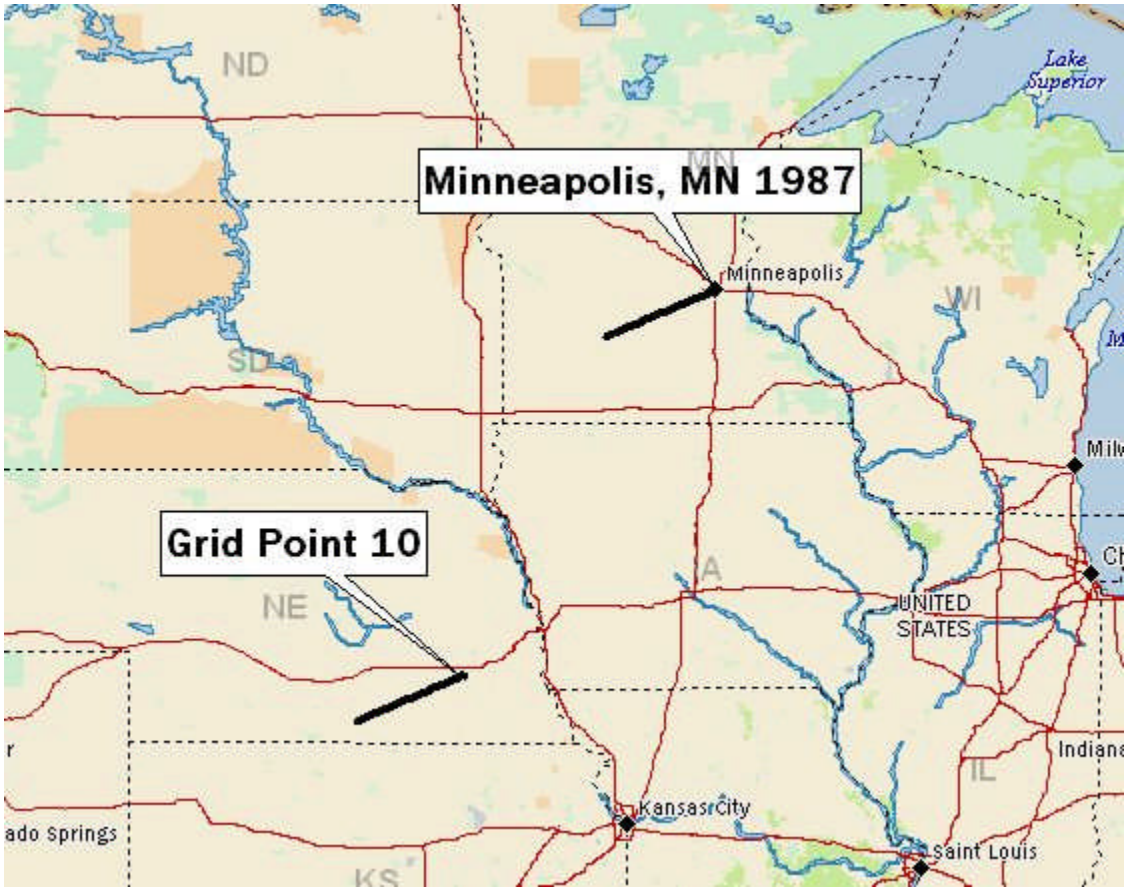
	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
100 sq miles	**10.5**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
200 sq miles	**10.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
500 sq miles	**8.7**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
1000 sq miles	**7.4**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
5000 sq miles	**4.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
10000 sq miles	**2.7**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
20000 sq miles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Adjusted Storm Depth-Area-Duration

	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
100 sq miles	**12.7**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
200 sq miles	**12.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
500 sq miles	**10.5**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
1000 sq miles	**8.8**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
5000 sq miles	**4.9**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
10000 sq miles	**3.3**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
20000 sq miles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Storm or Storm Center Name	**Minneapolis, MN**	
Storm Date(s)	23-Jul-1987	
Storm Type	MCC	
Storm Location	44.97 N	93.28 W
Storm Center Elevation	850	
Precipitation Total & Duration	10.55 Inches 3-hours EPRI Warm Season Storm Number 23	
Storm Representative Dewpoint	78.0 F	6hr average
Storm Representative Dewpoint Location	44.46 N	94.90 W
Maximum Dewpoint	82.5 F	
Moisture Inflow Vector	WSW @ 90	
In-place Maximization Factor	1.22	
Temporal Transposition (Date)	15-Jul	
Transposition Dewpoint Location	40.24 N	98.62 W
Transposition Maximum Dewpoint	83.0 F	
Basin Elevation	1,300	
Transposition to Basin Adjustment Factor	0.99	
Higher of Basin Elevation - Inflow Barrier Height	1,300	
Elevation Adjustment Factor	1.00	
Total Adjustment Factor	1.20	

Minneapolis, MN July 23, 1987 Inflow



Ogallala, NE July 6, 2002
Storm Type: MCC

Storm Name:	**Ogallala, NE**
Storm Date:	**06-Jul-2002**
AWA Analysis Date:	**12/2/2008**

Storm Adjustment for Nebraska Grid Point 14

Temporal Transposition Date **15-Jul**

	Lat	Long
Storm center location	**41.03 N**	**101.78 W**
Storm Rep dew point location	**39.34 N**	**101.97 W**
Transposition dewpoint location	**40.56 N**	**101.00 W**
Basin location	**41.25 N**	**96.66 W**

Moisture Inflow Direction:	**S @ 125**	miles
Basin Elevation	**3,117**	feet
Storm Elevation	**3,428**	feet
Storm Duration	**6hr**	feet

The storm representative dew point is	**74.5 F**	with total precipitable water above sea level of			**2.79**	inches.
The in-place maximum dew point is	**81.5 F**	with total precipitable water above sea level of			**3.84**	inches.
The transpositioned maximum dew point is	**82.0 F**	with total precipitable water above sea level of			**3.92**	inches.
The in-place storm elevation is	**3,428**	which subtracts	**0.775**	inches of precipitable water at	**74.5 F**	
The in-place storm elevation is	**3,428**	which subtracts	**0.99**	inches of precipitable water at	**81.5 F**	
The transposition basin elevation at	**3,117**	which subtracts	**0.9**	inches of precipitable water at	**82.0 F**	
The inflow barrier/basin elevation height is	**3,117**	which subtracts	**0.9**	inches of precipitable water at	**82.0 F**	

The in-place storm maximization factor is	**1.41**
The transposition/elevation to basin factor is	**1.06**
The barrier adjustment factor is	**1.00**
The total adjustment factor is	**1.50**

Notes: DAD values taken from SPAS 1033

Observed Storm Depth-Area-Duration

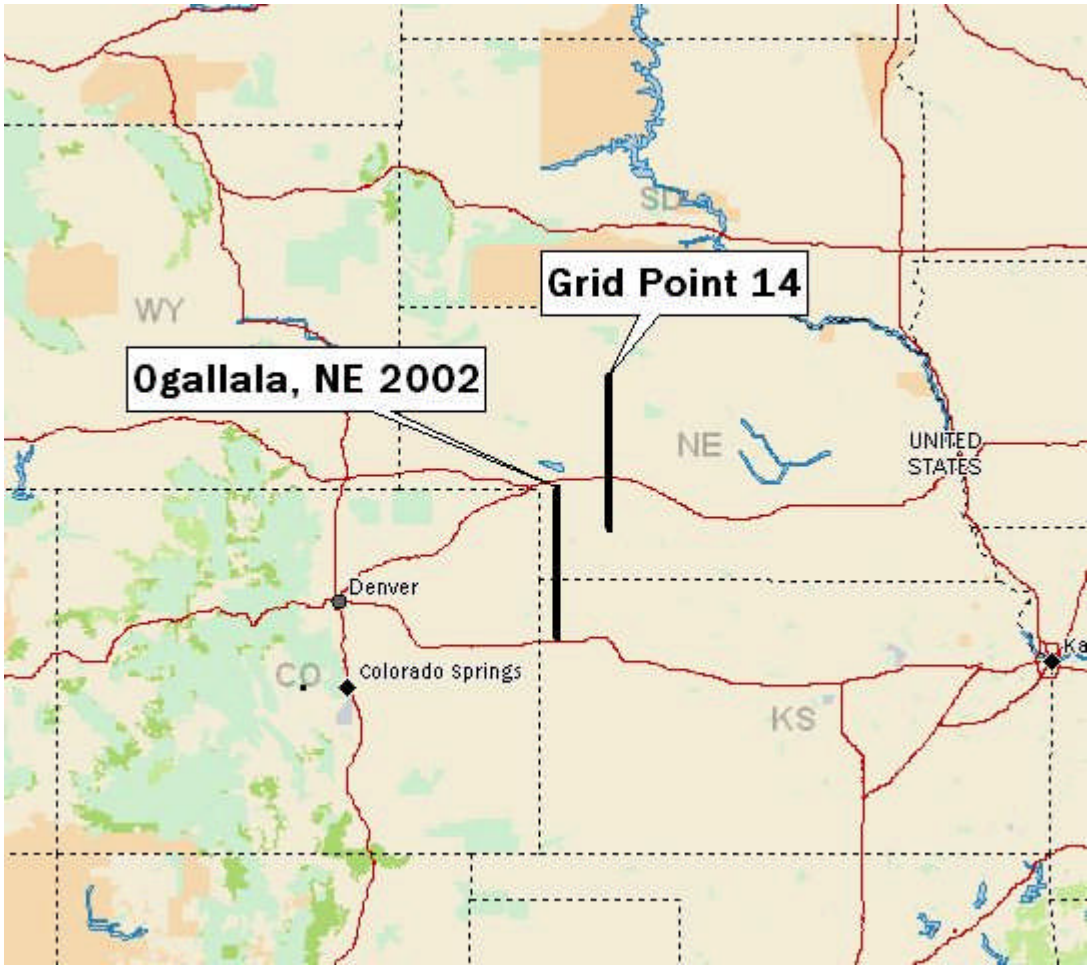
	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**12.5**	**14.4**	**14.4**	**14.5**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
100 sq miles	**10.1**	**11.7**	**11.7**	**11.8**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
200 sq miles	**8.8**	**10.2**	**10.3**	**10.5**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
500 sq miles	**6.7**	**8.1**	**8.3**	**8.5**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
1000 sq miles	**5.1**	**6.2**	**6.6**	**6.8**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
5000 sq miles	**2.0**	**2.7**	**3.1**	**3.2**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
10000 sq miles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
20000 sq miles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Adjusted Storm Depth-Area-Duration

	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**18.8**	**21.6**	**21.6**	**21.8**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
100 sq miles	**15.1**	**17.5**	**17.5**	**17.7**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
200 sq miles	**13.2**	**15.3**	**15.4**	**15.7**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
500 sq miles	**10.0**	**12.2**	**12.5**	**12.7**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
1000 sq miles	**7.7**	**9.4**	**9.9**	**10.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
5000 sq miles	**3.0**	**4.0**	**4.6**	**4.8**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
10000 sq miles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
20000 sq miles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Storm or Storm Center Name	**Ogallala, NE**
Storm Date(s)	6-Jul-2002
Storm Type	Synoptic-Thunderstorms
Storm Location	41.03 N 101.78 W
Storm Center Elevation	3,428
Precipitation Total & Duration	14.92 in 24hrs from SPAS 1033
Storm Representative Dewpoint	74.5 F 6hr average, Td taken from KGDC and KIRT from 07-06-2002 04Z local to 07-06-2002 11Z
Storm Representative Dewpoint Location	39.34 N 101.97 W
Maximum Dewpoint	81.5 F
Moisture Inflow Vector	S @ 125
In-place Maximization Factor	1.41
Temporal Transposition (Date)	15-Jul
Transposition Dewpoint Location	40.56 N 101.00 W
Transposition Maximum Dewpoint	82.0 F
Basin Elevation	3,117
Transposition to Basin Adjustment Factor	1.06
Higher of Basin Elevation - Inflow Barrier Height	3,117
Elevation Adjustment Factor	1.00
Total Adjustment Factor	1.50

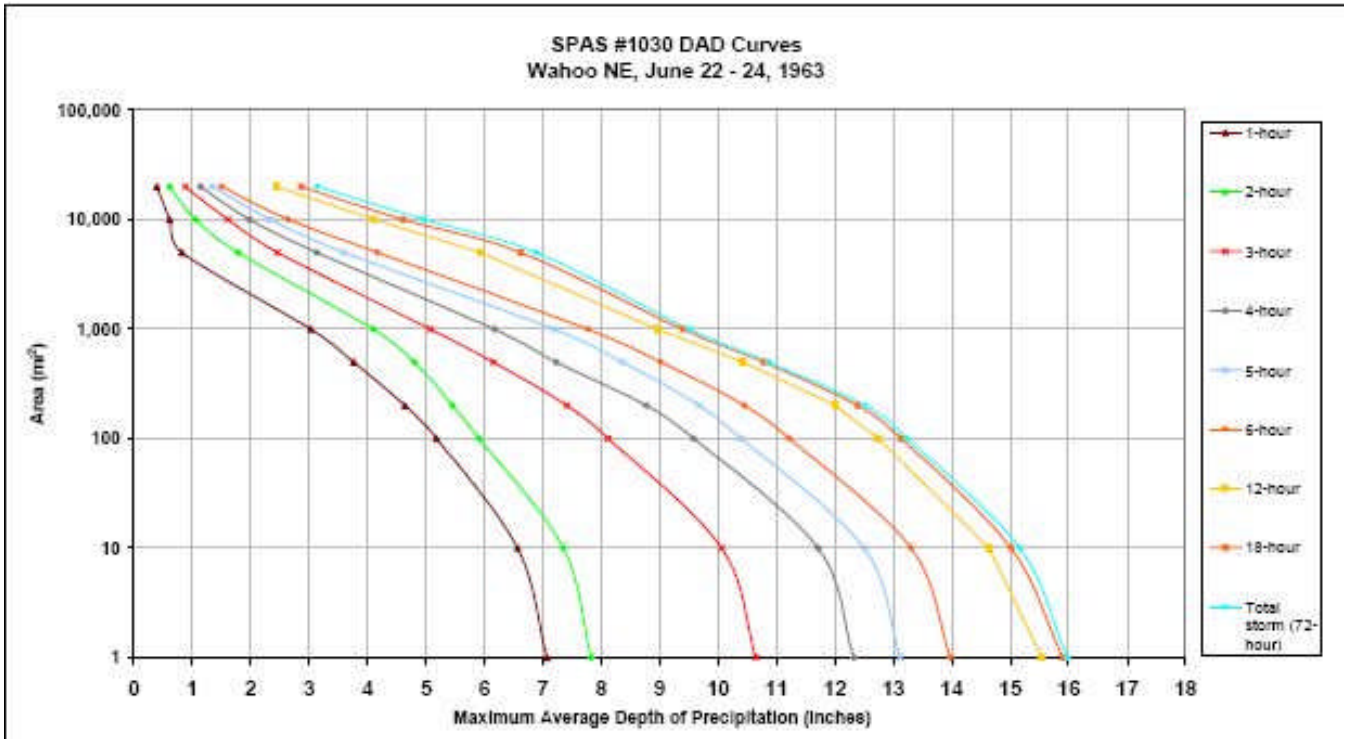
Ogallala, NE July 6, 2002 Inflow

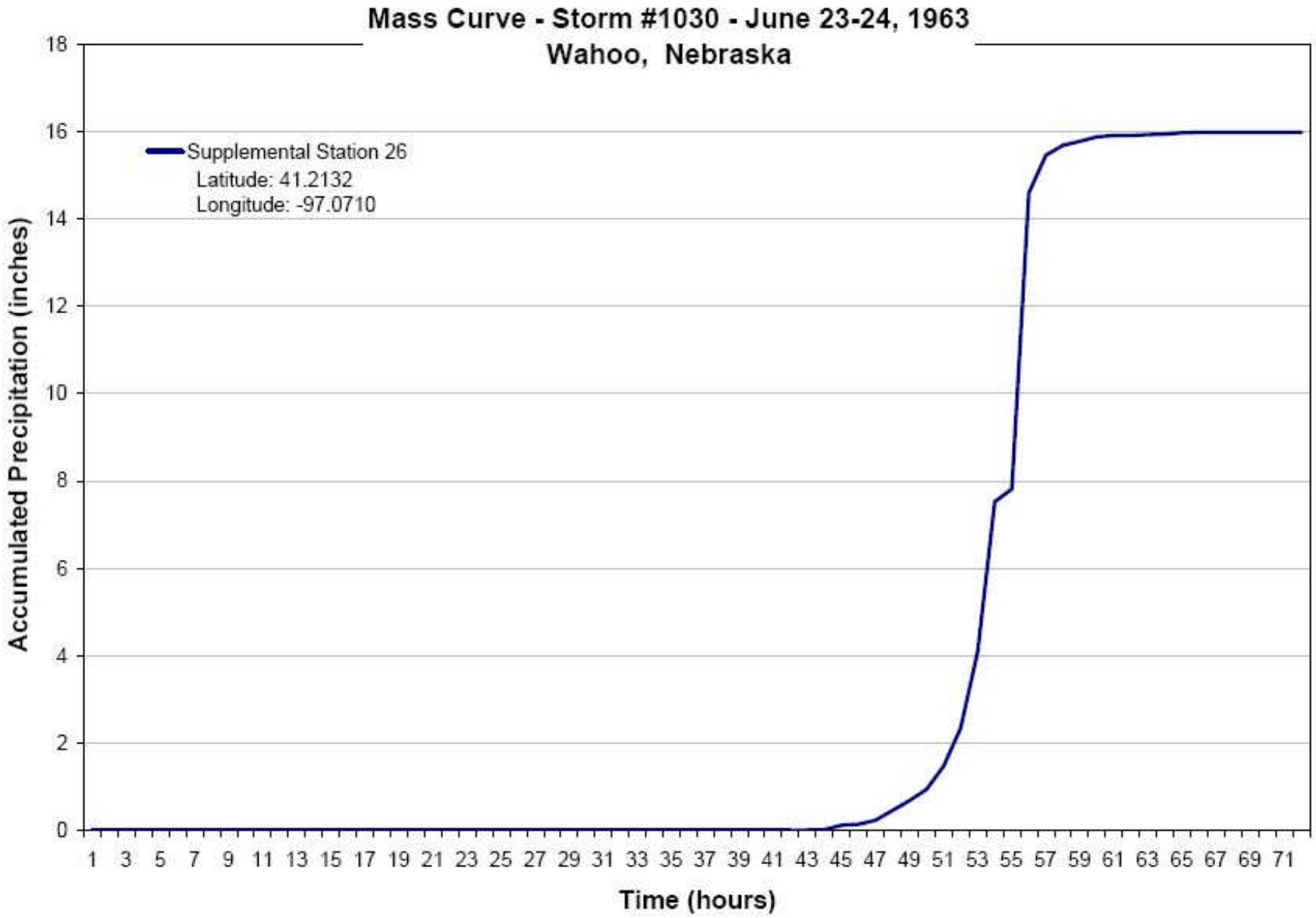


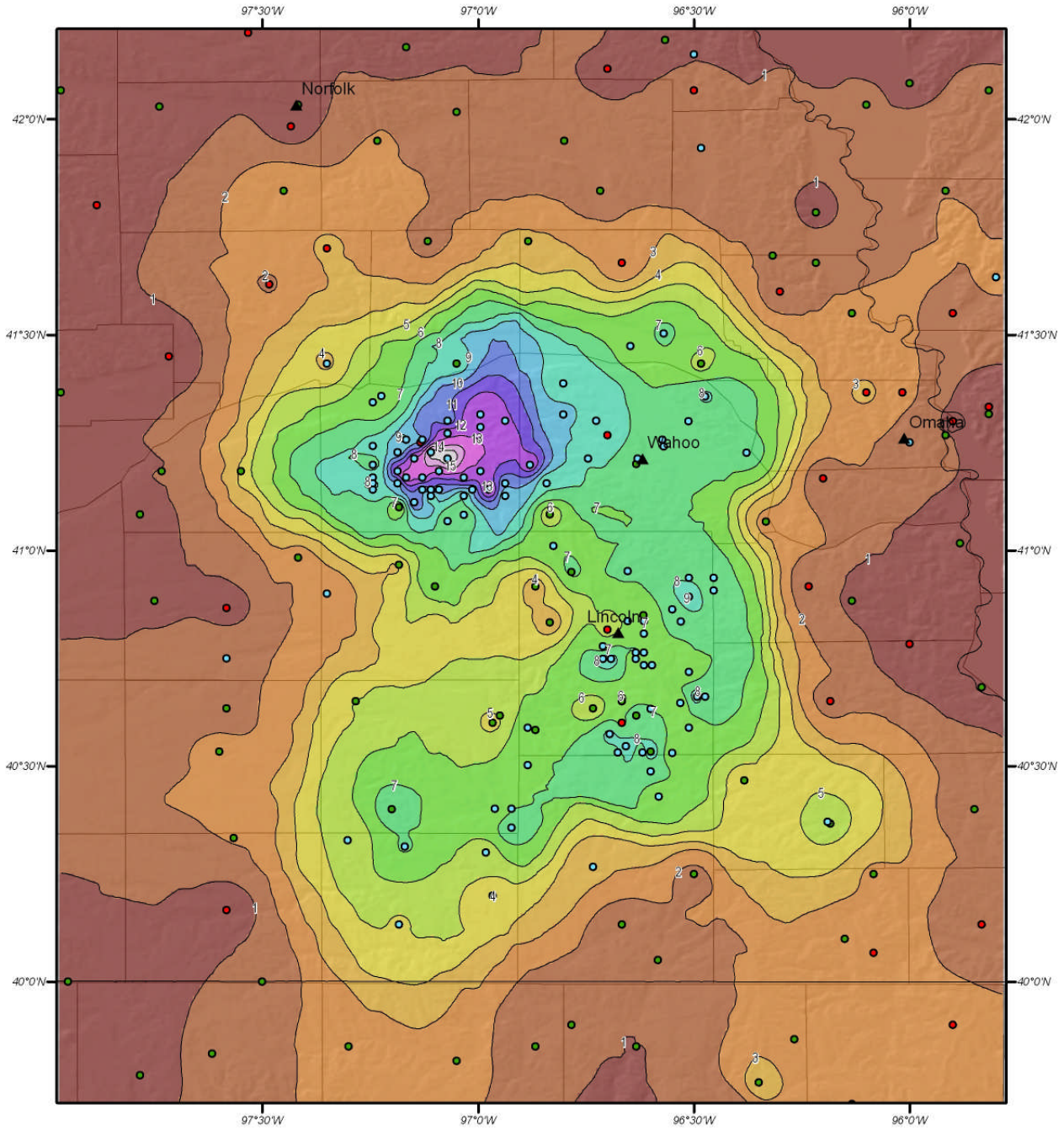
Storm 1030 - Wahoo NE, June 22 - 24, 1963

MAXIMUM AVERAGE DEPTH OF PRECIPITATION (INCHES)

Area (mi²)	Duration (hours)												
	1	2	3	4	5	6	12	18	24	36	48	72	total
1	7.07	7.83	10.65	12.32	13.12	13.96	15.54	15.90	15.98	15.98	15.98	15.96	15.96
10	6.57	7.35	10.06	11.71	12.50	13.30	14.64	15.01	15.15	15.13	15.13	15.16	15.16
100	5.18	5.91	8.12	9.58	10.39	11.22	12.74	13.13	13.23	13.23	13.23	13.23	13.23
200	4.64	5.45	7.41	8.77	9.68	10.45	12.01	12.39	12.49	12.49	12.50	12.52	12.52
500	3.76	4.80	6.15	7.23	8.36	9.02	10.43	10.78	10.82	10.84	10.86	10.87	10.87
1,000	3.03	4.10	5.08	6.17	7.19	7.77	8.96	9.39	9.45	9.47	9.48	9.51	9.51
5,000	0.82	1.76	2.46	3.13	3.59	4.17	5.93	6.62	6.80	6.85	6.86	6.86	6.88
10,000	0.61	1.05	1.61	1.98	2.34	2.64	4.11	4.61	4.92	4.94	4.96	4.96	4.96
20,000	0.39	0.61	0.88	1.14	1.34	1.50	2.44	2.86	3.11	3.12	3.13	3.14	3.14




Mass Curve - Storm #1030 - June 23-24, 1963
Wahoo, Nebraska
Supplemental Station 26
Latitude: 41.2132
Longitude: -97.0710
Accumulated Precipitation (inches)
0
2
4
6
8
10
12
14
16
18
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49 51 53 55 57 59 61 63 65 67 69 71
Time (hours)



SPAS Storm #1030 - June 22 to 24, 1963
Total Rainfall (72-hours) - Wahoo, Nebraska

Precipitation (inches)

0.05 - 1.00	4.01 - 5.00	8.01 - 9.00	12.01 - 13.00
1.01 - 2.00	5.01 - 6.00	9.01 - 10.00	13.01 - 14.00
2.01 - 3.00	6.01 - 7.00	10.01 - 11.00	14.01 - 15.00
3.01 - 4.00	7.01 - 8.00	11.01 - 12.00	15.01 - 16.00

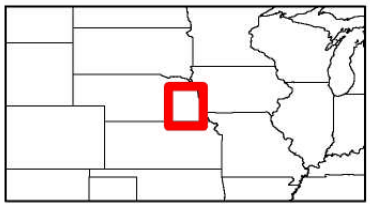
Gauging Stations

Daily · Hourly Pseudo · Hourly · Supplemental

N

0 5 10 20 Miles

0 10 20 40 60 Kilometers



Coordinate system: GCS North American 1983
Scale: 1:44,522,173 *Metstat/AWA March 1, 2007*

Paris Waterworks, IN June 27. 1957
Storm Type: MCC

Storm Name:	**Paris Waterworks, IN**
Storm Date:	**27-Jun-1957**
AWA Analysis Date:	**12/2/2008**

Storm Adjustment for Nebraska Grid Point 10

Temporal Transposition Date **13-Jul**

	Lat	Long
Storm center location	**39.61 N**	**87.90 W**
Storm Rep dew point location	**36.92 N**	**89.09 W**
Transposition dewpoint location	**38.06 N**	**98.19 W**
Basin location	**41.25 N**	**96.66 W**

Moisture Inflow Direction:	**SSW @ 200**	miles
Basin Elevation	**1,300**	feet
Storm Elevation	**700**	feet
Storm Duration	**12hr**	feet

The storm representative dew point is	**73.0 F**	with total precipitable water above sea level of			**2.60**	inches.
The in-place maximum dew point is	**80.5 F**	with total precipitable water above sea level of			**3.68**	inches.
The transpositioned maximum dew point is	**80.5 F**	with total precipitable water above sea level of			**3.68**	inches.
The in-place storm elevation is	**700**	which subtracts	**0.14**	inches of precipitable water at	**73.0 F**	
The in-place storm elevation is	**700**	which subtracts	**0.215**	inches of precipitable water at	**80.5 F**	
The transposition basin elevation at	**1,300**	which subtracts	**0.395**	inches of precipitable water at	**80.5 F**	
The inflow barrier/basin elevation height is	**1,300**	which subtracts	**0.395**	inches of precipitable water at	**80.5 F**	

The in-place storm maximization factor is	**1.41**
The transposition/elevation to basin factor is	**0.95**
The barrier adjustment factor is	**1.00**
The total adjustment factor is	**1.34**

Notes: DAD values taken from EPRI Storm Number 18, HMB V-18

Observed Storm Depth-Area-Duration

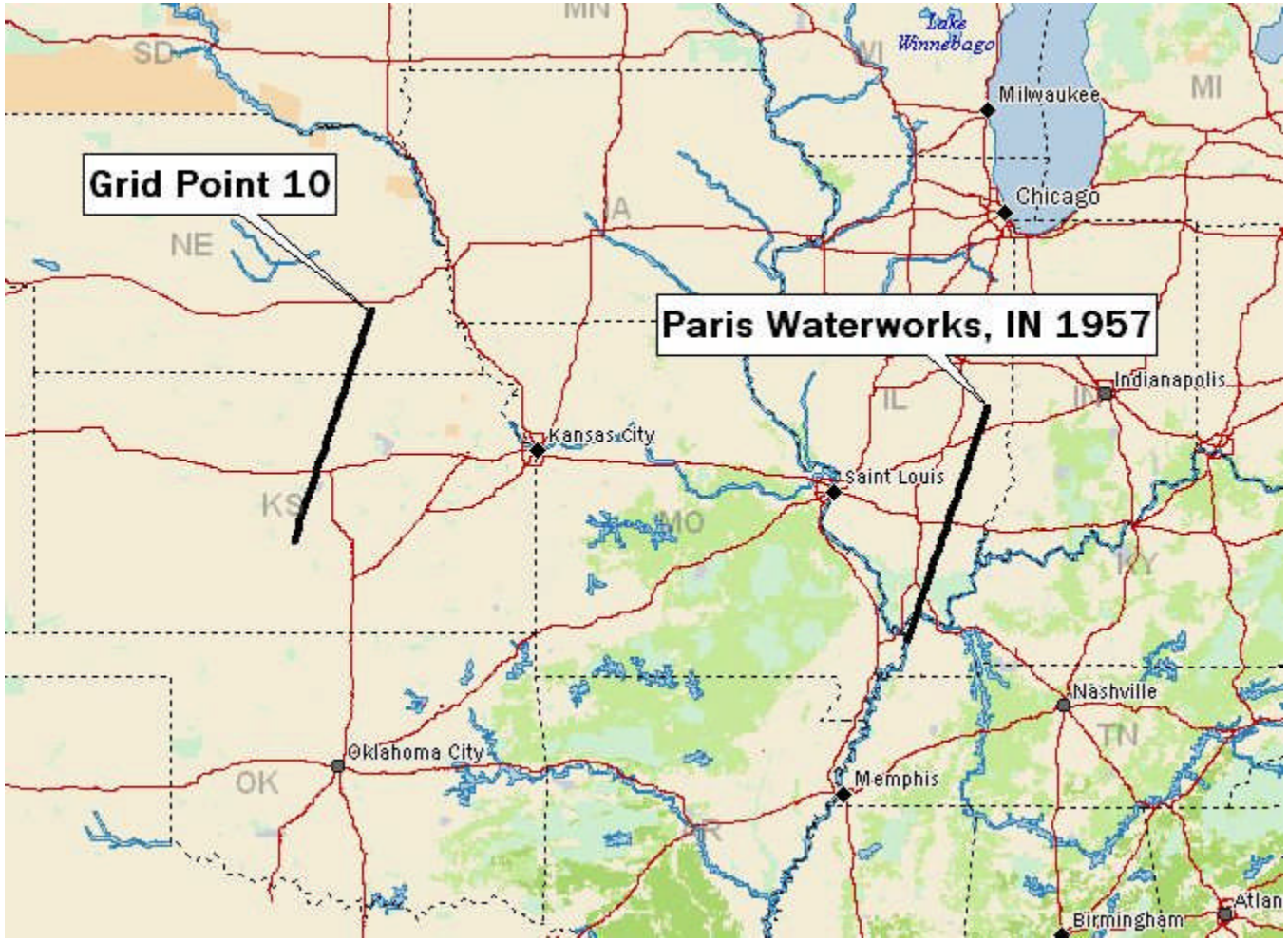
	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
100 sq miles	**8.0**	**10.9**	**0.0**	**11.5**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
200 sq miles	**7.6**	**10.3**	**0.0**	**11.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
500 sq miles	**6.8**	**9.3**	**0.0**	**10.2**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
1000 sq miles	**6.2**	**8.4**	**0.0**	**9.4**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
5000 sq miles	**4.4**	**5.9**	**0.0**	**7.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
10000 sq miles	**3.6**	**4.7**	**0.0**	**6.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
20000 sq miles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Adjusted Storm Depth-Area-Duration

	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
100 sq miles	**10.7**	**14.6**	**0.0**	**15.4**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
200 sq miles	**10.1**	**13.8**	**0.0**	**14.8**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
500 sq miles	**9.1**	**12.4**	**0.0**	**13.6**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
1000 sq miles	**8.3**	**11.2**	**0.0**	**12.6**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
5000 sq miles	**5.9**	**7.9**	**0.0**	**9.5**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
10000 sq miles	**4.8**	**6.3**	**0.0**	**8.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
20000 sq miles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Storm or Storm Center Name	**Paris Waterworks, IN**	
Storm Date(s)	27-Jun-1957	
Storm Type	Synoptic	
Storm Location	39.61 N	87.90 W
Storm Center Elevation	700	
Precipitation Total & Duration	12.40 Inches 24-hours HMB V-18	
Storm Representative Dewpoint	73.0 F	12hr average, 7° added to USACE storm rep Td based on ERPI and Wanahoo guidance
Storm Representative Dewpoint Location	36.92 N	89.09 W
Maximum Dewpoint	80.5 F	
Moisture Inflow Vector	SSW @ 200 Miles	
In-place Maximization Factor	1.41	
Temporal Transposition (Date)	13-Jul	
Transposition Dewpoint Location	38.06 N	98.19 W
Transposition Maximum Dewpoint	80.5 F	
Basin Elevation	1,300	
Transposition to Basin Adjustment Factor	0.95	
Higher of Basin Elevation - Inflow Barrier Height	1,300	
Elevation Adjustment Factor	1.00	
Total Adjustment Factor	1.34	

Paris Waterworks, IN June 27. 1957 Inflow



Pawnee Creek, CO July 28, 1997
Storm Type: MCC

Storm Name:	**Pawnee Creek, CO**
Storm Date:	**28-Jul-1997**
AWA Analysis Date:	**12/2/2008**

Storm Adjustment for Nebraska Grid Point 13

Temporal Transposition Date **15-Jul**

	Lat	Long
Storm center location	**40.78 N**	**103.63 W**
Storm Rep dew point location	**39.20 N**	**100.15 W**
Transposition dewpoint location	**41.43 N**	**98.96 W**
Basin location	**41.25 N**	**96.66 W**

Moisture Inflow Direction:	**SE @ 215 M**	miles
Basin Elevation	**4,432**	feet
Storm Elevation	**4,500**	feet
Storm Duration	**6hr**	feet

The storm representative dew point is	**75.5 F**	with total precipitable water above sea level of			**2.92**	inches.
The in-place maximum dew point is	**81.0 F**	with total precipitable water above sea level of			**3.76**	inches.
The transpositioned maximum dew point is	**82.5**	with total precipitable water above sea level of			**3.84**	inches.
The in-place storm elevation is	**4,500**	which subtracts	**1.02**	inches of precipitable water at	**75.5 F**	
The in-place storm elevation is	**4,500**	which subtracts	**1.22**	inches of precipitable water at	**81.0 F**	
The transposition basin elevation at	**4,432**	which subtracts	**1.215**	inches of precipitable water at	**82.5**	
The inflow barrier/basin elevation height is	**4,432**	which subtracts	**1.215**	inches of precipitable water at	**82.5**	

The in-place storm maximization factor is	**1.34**
The transposition/elevation to basin factor is	**1.03**
The barrier adjustment factor is	**1.00**
The total adjustment factor is	**1.38**

Notes: DAD values taken from SPAS 1036.

Observed Storm Depth-Area-Duration

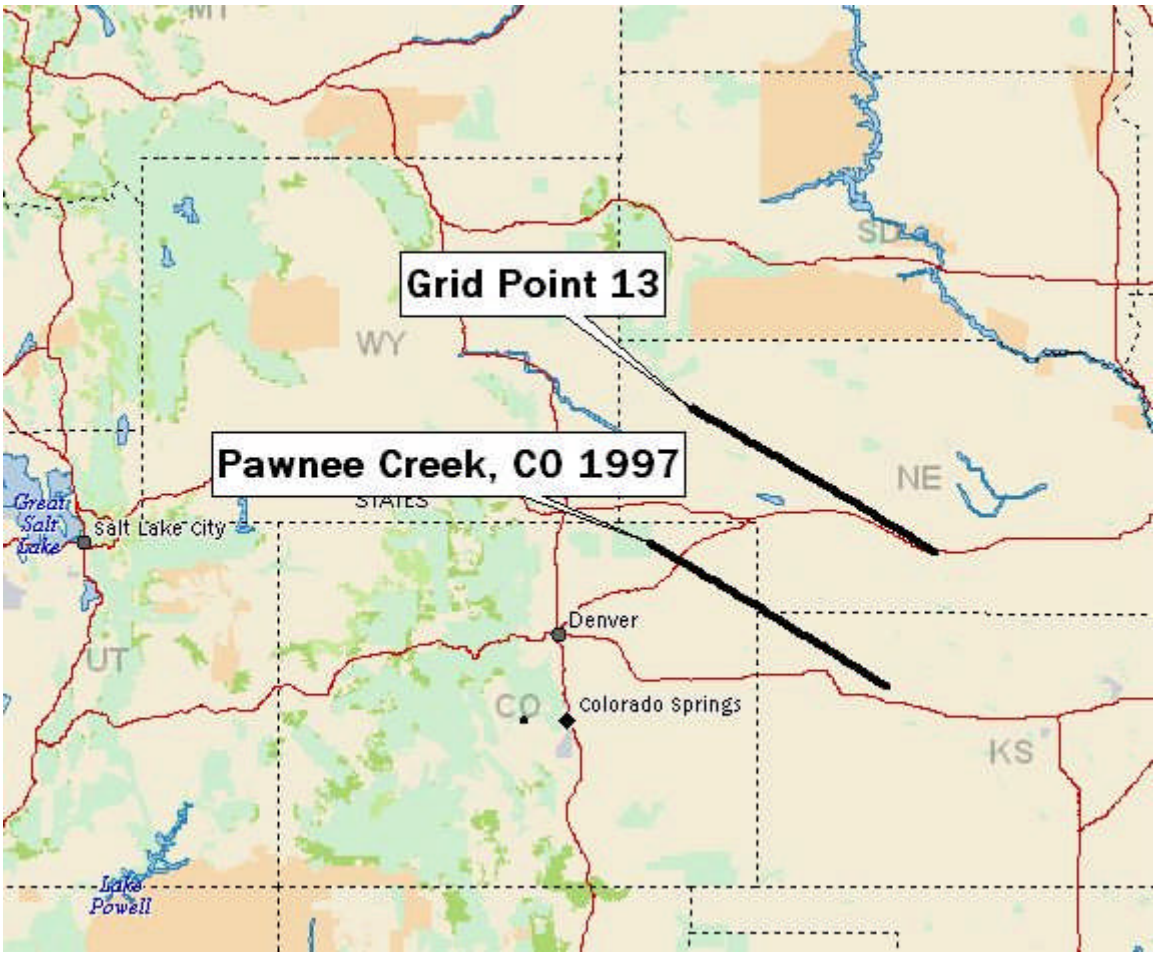
	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**12.3**	**13.2**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
100 sq miles	**9.5**	**11.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
200 sq miles	**8.0**	**9.5**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
500 sq miles	**6.0**	**7.3**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
1000 sq miles	**4.7**	**6.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
5000 sq miles	**1.7**	**2.6**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
10000 sq miles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
20000 sq miles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Adjusted Storm Depth-Area-Duration

	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**16.9**	**18.3**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
100 sq miles	**13.2**	**15.3**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
200 sq miles	**11.1**	**13.2**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
500 sq miles	**8.3**	**10.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
1000 sq miles	**6.5**	**8.2**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
5000 sq miles	**2.3**	**3.6**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
10000 sq miles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
20000 sq miles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Storm or Storm Center Name	**Pawnee Creek, CO**		
Storm Date(s)	28-Jul-1997		
Storm Type	MCC-Thunderstorms		
Storm Location	40.78 N	103.63 W	
Storm Center Elevation	4,500		
Precipitation Total & Duration	13.58" from SPAS 1037, 13.7 Inches 12-hours Colorado Climate Center report,		
Storm Representative Dewpoint	75.5 F	6hr average	
Storm Representative Dewpoint Location	39.20 N	100.15 W	Storm Rep Td Ave of KHLC 19Z/28th-01Z/29th, KHYS
Maximum Dewpoint	81.0 F		21Z/28th-02Z/29th, KGLD 00Z-05Z/29th,original storm
Moisture Inflow Vector	SE @ 215 Miles		analysis used 24hr average from KGLD
In-place Maximization Factor	1.34		
Temporal Transposition (Date)	15-Jul		
Transposition Dewpoint Location	41.43 N	98.96 W	
Transposition Maximum Dewpoint	82.5		
Basin Elevation	4,432		
Transposition to Basin Adjustment Factor	1.03		
Higher of Basin Elevation - Inflow Barrier Height	4,432		
Elevation Adjustment Factor	1.00		
Total Adjustment Factor	1.38		

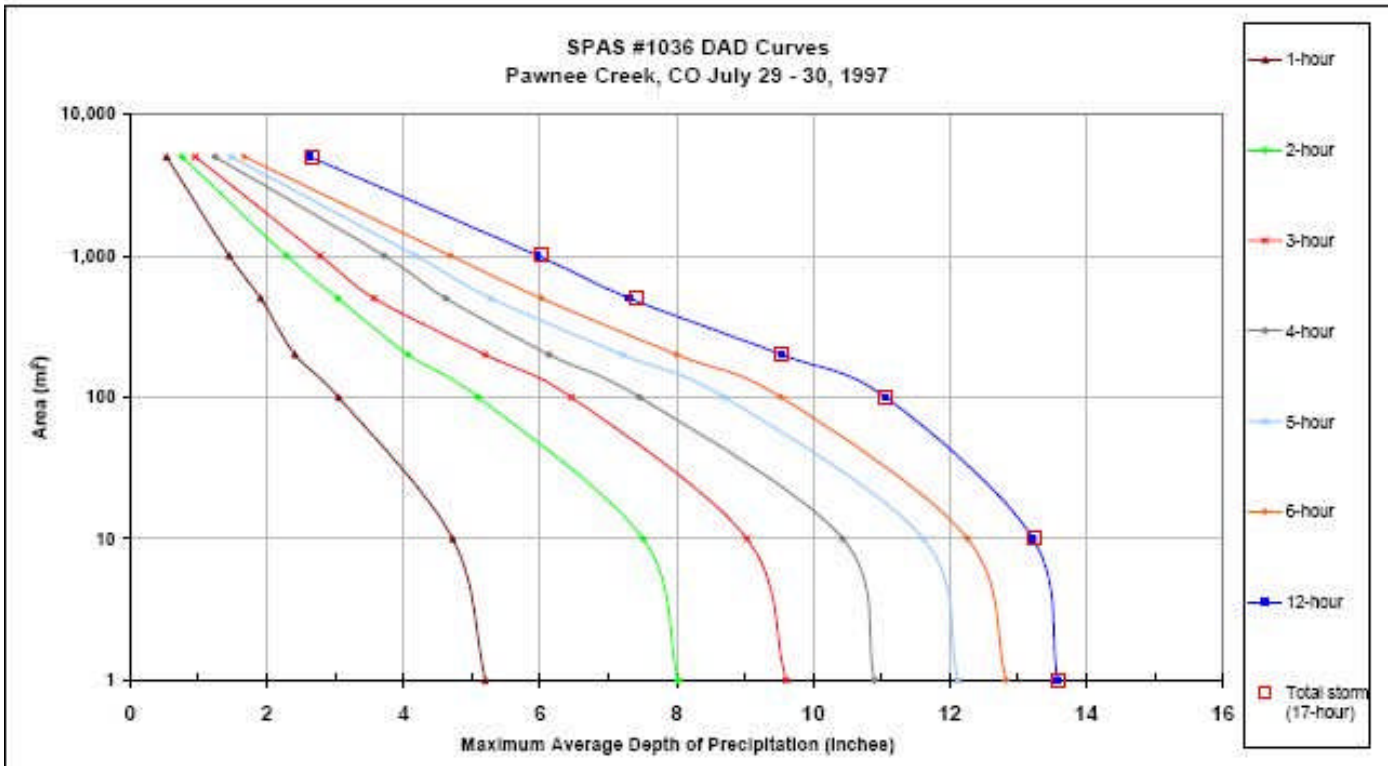
Pawnee Creek, CO July 28, 1997 Inflow

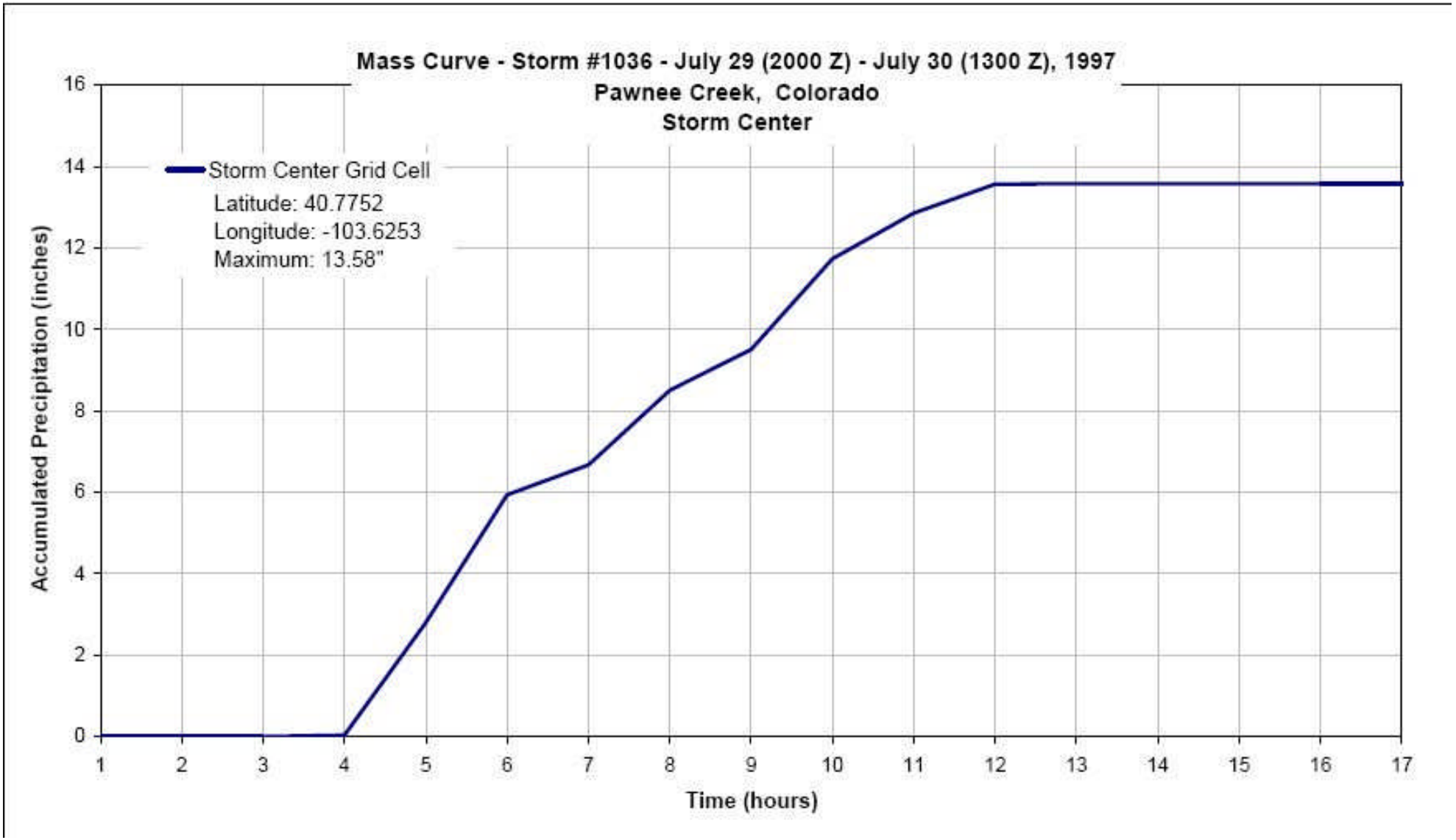


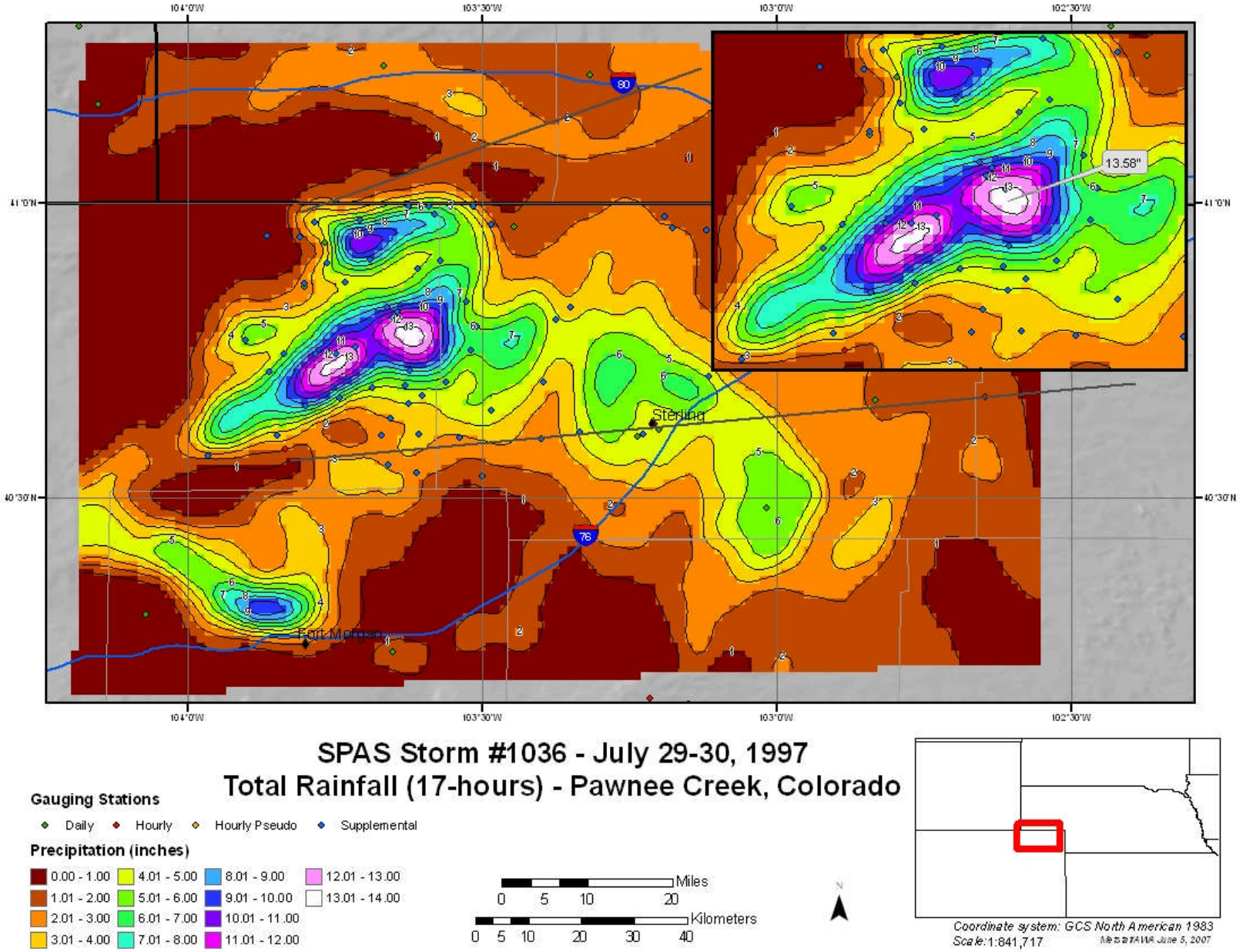
Storm 1036 - Pawnee Creek, CO July 29 - 30, 1997

MAXIMUM AVERAGE DEPTH OF PRECIPITATION (INCHES)

Area (mi^2)	Duration (hours)								
	1	2	3	4	5	6	12	17	total
1	5.20	8.02	9.60	10.90	12.12	12.83	13.58	13.58	13.58
10	4.72	7.51	9.03	10.43	11.61	12.26	13.22	13.23	13.23
100	3.05	5.09	6.46	7.46	8.70	9.53	11.06	11.07	11.07
200	2.41	4.07	5.20	6.13	7.21	8.00	9.54	9.55	9.55
500	1.91	3.04	3.57	4.62	5.28	6.02	7.31	7.42	7.42
1,000	1.45	2.29	2.78	3.72	4.18	4.69	5.97	6.01	6.01
5,000	0.53	0.76	0.95	1.24	1.48	1.67	2.63	2.67	2.67




Mass Curve - Storm #1036 - July 29 (2000 Z) - July 30 (1300 Z), 1997
Pawnee Creek, Colorado
Storm Center
Storm Center Grid Cell
Latitude: 40.7752
Longitude: -103.6253
Maximum: 13.58"
Accumulated Precipitation (inches)
Time (hours)
0
2
4
6
8
10
12
14
16
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17


104°0'W
103°30'W
103°0'W
102°30'W
41°0'N
40°30'N
80
76
13.58"
Sterling
Fort Morgan
SPAS Storm #1036 - July 29-30, 1997
Total Rainfall (17-hours) - Pawnee Creek, Colorado
Gauging Stations
Daily
Hourly
Hourly Pseudo
Supplemental
Precipitation (inches)
0.00 - 1.00
1.01 - 2.00
2.01 - 3.00
3.01 - 4.00
4.01 - 5.00
5.01 - 6.00
6.01 - 7.00
7.01 - 8.00
8.01 - 9.00
9.01 - 10.00
10.01 - 11.00
11.01 - 12.00
12.01 - 13.00
13.01 - 14.00
Miles
0 5 10 20
Kilometers
0 5 10 20 30 40
N
Coordinate system: GCS North American 1983
Scale: 1:841,717
MesoTAMU June 5, 2007

Prague, NE August 1, 1959
Storm Type: MCC

Storm Name:	**Prague, NE**
Storm Date:	**01-Aug-1959**
AWA Analysis Date:	**12/2/2008**

Storm Adjustment for Nebraska Grid Point 10

Temporal Transposition Date **1-Aug**

	Lat	Long
Storm center location	**41.36 N**	**96.88 W**
Storm Rep dew point location	**39.22 N**	**95.71 W**
Transposition dewpoint location	**38.61 N**	**95.83 W**
Basin location	**41.25 N**	**96.66 W**

Moisture Inflow Direction:	**SSE @ 160**	miles
Basin Elevation	**1,300**	feet
Storm Elevation	**1,500**	feet
Storm Duration	**12hr**	feet

The storm representative dew point is	**72.5 F**	with total precipitable water above sea level of			**2.54**	inches.
The in-place maximum dew point is	**81.0 F**	with total precipitable water above sea level of			**3.76**	inches.
The transpositioned maximum dew point is	**81.0 F**	with total precipitable water above sea level of			**3.76**	inches.
The in-place storm elevation is	**1,500**	which subtracts	**0.345**	inches of precipitable water at	**72.5 F**	
The in-place storm elevation is	**1,500**	which subtracts	**0.44**	inches of precipitable water at	**81.0 F**	
The transposition basin elevation at	**1,300**	which subtracts	**0.385**	inches of precipitable water at	**81.0 F**	
The inflow barrier/basin elevation height is	**1,300**	which subtracts	**0.385**	inches of precipitable water at	**81.0 F**	

The in-place storm maximization factor is	**1.50**
The transposition/elevation to basin factor is	**1.02**
The barrier adjustment factor is	**1.00**
The total adjustment factor is	**1.52**

Notes: In-place maximization factor of 1.51, although a factor of 1.50 was adopted as the upper limit for this study through guidance from HMRs 55A and 51. DAD values taken from SPAS 1031.

Observed Storm Depth-Area-Duration

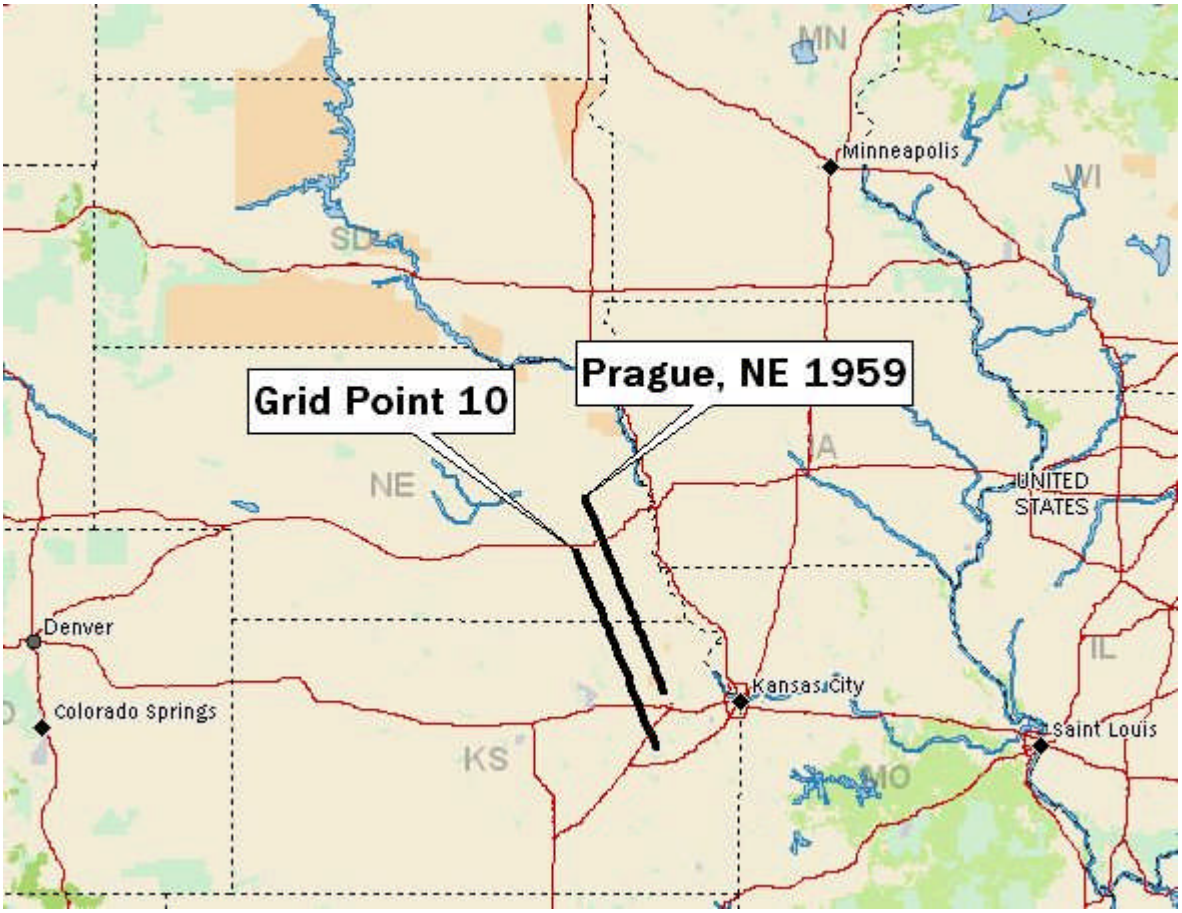
	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**6.8**	**9.3**	**9.7**	**10.0**	**0.0**	**10.0**	**10.5**	**0.0**	**10.5**
100 sq miles	**5.5**	**7.8**	**8.4**	**8.6**	**0.0**	**8.6**	**9.0**	**0.0**	**9.1**
200 sq miles	**5.0**	**7.3**	**7.9**	**8.3**	**0.0**	**8.3**	**8.7**	**0.0**	**8.7**
500 sq miles	**4.5**	**6.6**	**7.1**	**7.4**	**0.0**	**7.4**	**7.9**	**0.0**	**8.0**
1000 sq miles	**4.0**	**5.8**	**6.4**	**6.8**	**0.0**	**6.8**	**7.3**	**0.0**	**7.4**
5000 sq miles	**2.2**	**3.3**	**3.8**	**4.1**	**0.0**	**4.1**	**4.6**	**0.0**	**4.6**
10000 sq miles	**1.3**	**2.0**	**2.4**	**2.6**	**0.0**	**2.6**	**3.0**	**0.0**	**3.0**
20000 sq miles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Adjusted Storm Depth-Area-Duration

	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**10.4**	**14.1**	**14.8**	**15.3**	**0.0**	**15.3**	**16.0**	**0.0**	**16.0**
100 sq miles	**8.4**	**11.8**	**12.8**	**13.1**	**0.0**	**13.1**	**13.7**	**0.0**	**13.9**
200 sq miles	**7.6**	**11.2**	**12.1**	**12.6**	**0.0**	**12.6**	**13.2**	**0.0**	**13.3**
500 sq miles	**6.9**	**10.0**	**10.8**	**11.3**	**0.0**	**11.3**	**12.1**	**0.0**	**12.2**
1000 sq miles	**6.1**	**8.8**	**9.7**	**10.4**	**0.0**	**10.4**	**11.2**	**0.0**	**11.3**
5000 sq miles	**3.4**	**5.0**	**5.8**	**6.2**	**0.0**	**6.2**	**7.0**	**0.0**	**7.1**
10000 sq miles	**2.0**	**3.1**	**3.6**	**3.9**	**0.0**	**3.9**	**4.6**	**0.0**	**4.6**
20000 sq miles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Storm or Storm Center Name	**Prague, NE**	
Storm Date(s)	1-Aug-1959	
Storm Type	MCC	
Storm Location	41.36 N	96.88 W
Storm Center Elevation	1,500	
Precipitation Total & Duration	13.09 Inches 24-hours USACE Bucket Survey Data	
Storm Representative Dewpoint	72.5 F	12hr average taken from KMCK and KTOP from 8-1 8Z to 8-1 20Z
Storm Representative Dewpoint Location	39.22 N	95.71 W
Maximum Dewpoint	81.0 F	
Moisture Inflow Vector	SSE @ 160 Miles	
In-place Maximization Factor	1.50	
Temporal Transposition (Date)	1-Aug	
Transposition Dewpoint Location	38.61 N	95.83 W
Transposition Maximum Dewpoint	81.0 F	
Basin Elevation	1,300	
Transposition to Basin Adjustment Factor	1.02	
Higher of Basin Elevation - Inflow Barrier Height	1,300	
Elevation Adjustment Factor	1.00	
Total Adjustment Factor	1.52	

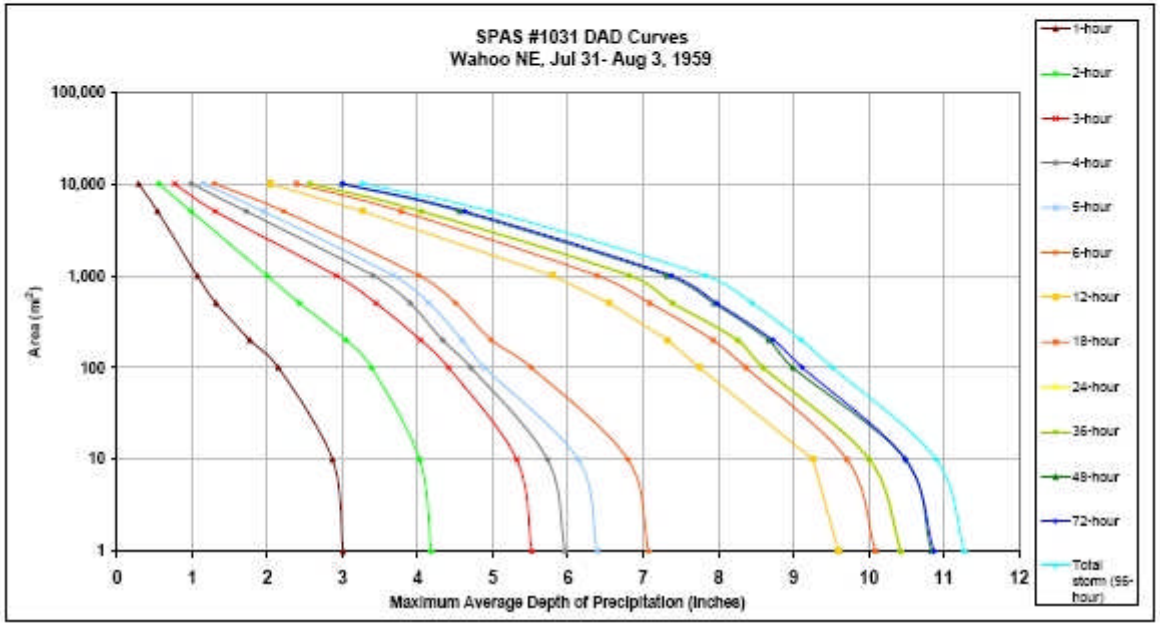
Prague, NE August 1, 1959 Inflow

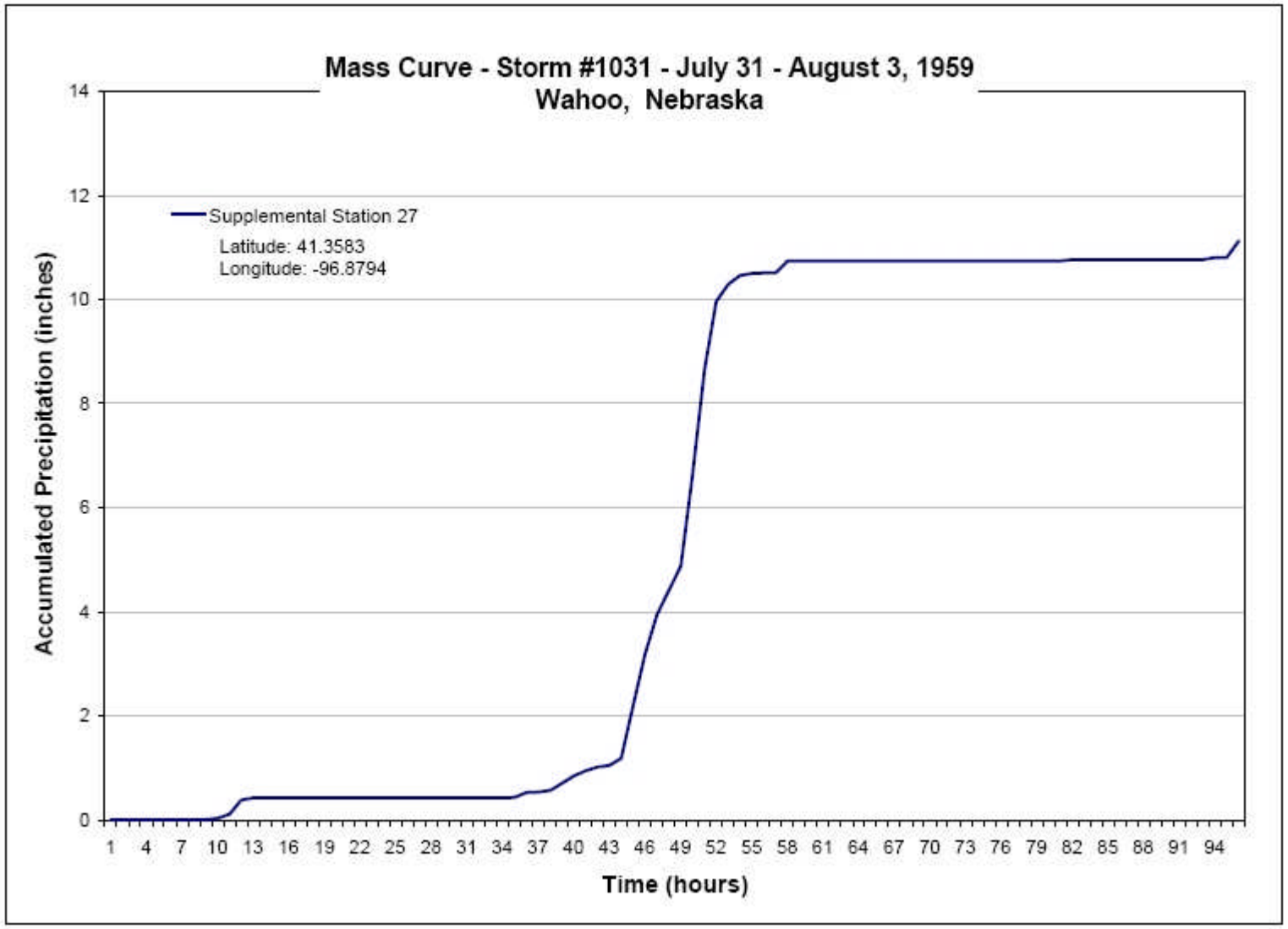


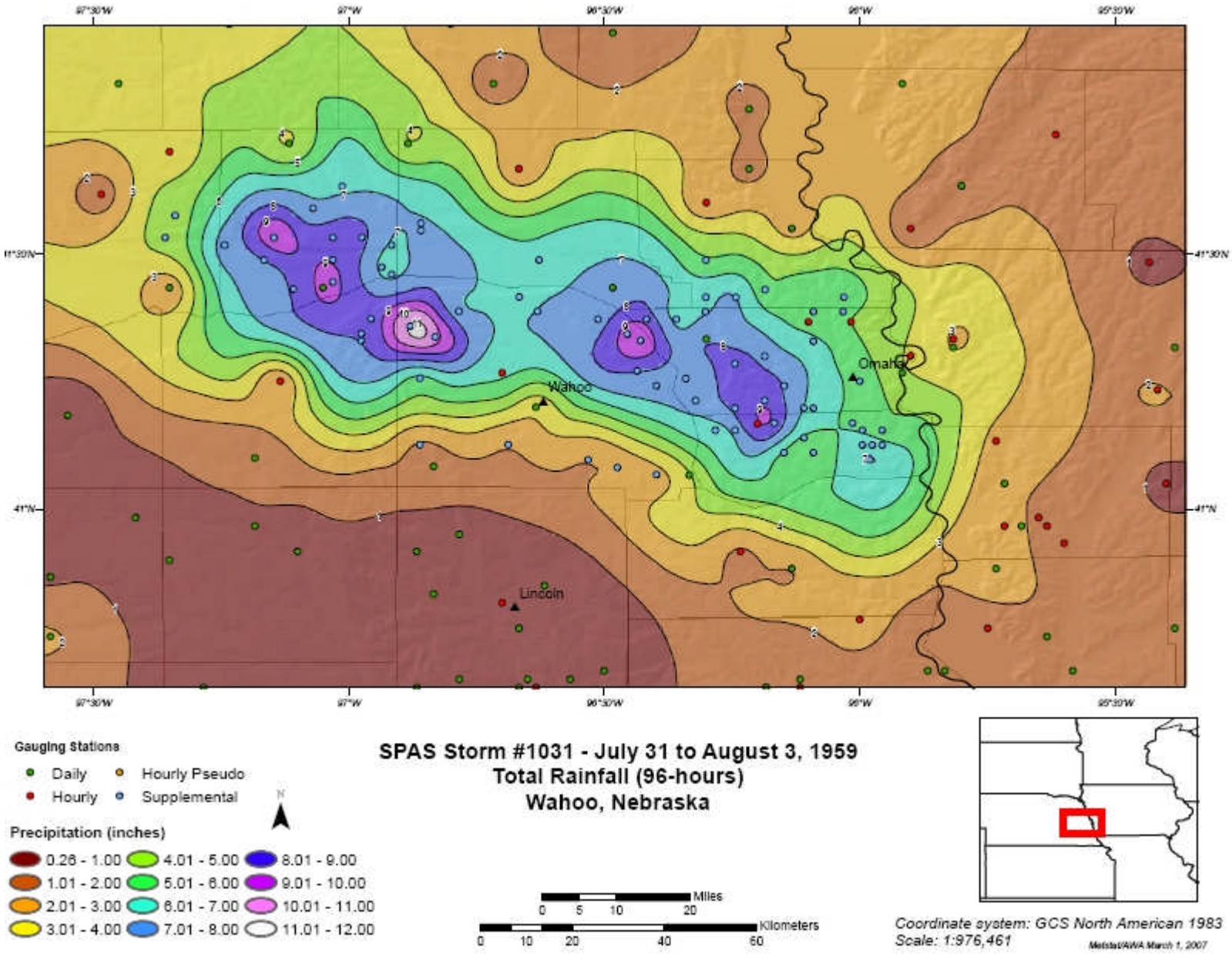
Storm 1031 - Wahoo NE, Jul 31 - Aug 3, 1959

MAXIMUM AVERAGE DEPTH OF PRECIPITATION (INCHES)

Area (mi²)	Duration (hours)													
	1	2	3	4	5	6	12	18	24	36	48	72	96	total
1	3.01	4.18	5.52	5.96	6.39	7.07	9.60	10.09	10.43	10.43	10.83	10.87	11.27	11.27
10	2.87	4.03	5.32	5.73	6.14	6.80	9.26	9.71	10.01	10.01	10.49	10.49	10.90	10.90
100	2.15	3.39	4.41	4.71	4.89	5.51	7.75	8.37	8.60	8.60	8.99	9.12	9.52	9.52
200	1.77	3.05	4.04	4.33	4.59	4.96	7.33	7.93	8.25	8.26	8.67	8.73	9.10	9.10
500	1.32	2.43	3.45	3.90	4.15	4.51	6.55	7.09	7.39	7.39	7.94	7.96	8.45	8.45
1,000	1.07	2.00	2.92	3.41	3.68	4.02	5.80	6.39	6.82	6.82	7.32	7.36	7.83	7.83
5,000	0.54	0.99	1.31	1.72	1.95	2.22	3.27	3.78	4.05	4.05	4.56	4.63	4.96	4.96
10,000	0.29	0.56	0.77	0.99	1.15	1.30	2.04	2.39	2.57	2.57	2.99	3.01	3.27	3.27




Mass Curve - Storm #1031 - July 31 - August 3, 1959
Wahoo, Nebraska
Supplemental Station 27
Latitude: 41.3583
Longitude: -96.8794
Accumulated Precipitation (inches)
0
2
4
6
8
10
12
14
1 4 7 10 13 16 19 22 25 28 31 34 37 40 43 46 49 52 55 58 61 64 67 70 73 76 79 82 85 88 91 94
Time (hours)


97°30'W
97°W
96°30'W
96°W
95°30'W
41°30'N
41°N
Wahoo
Omaha
Lincoln
Gauging Stations
Daily
Hourly Pseudo
Hourly
Supplemental
N
Precipitation (inches)
0.26 - 1.00
1.01 - 2.00
2.01 - 3.00
3.01 - 4.00
4.01 - 5.00
5.01 - 6.00
6.01 - 7.00
7.01 - 8.00
8.01 - 9.00
9.01 - 10.00
10.01 - 11.00
11.01 - 12.00
SPAS Storm #1031 - July 31 to August 3, 1959
Total Rainfall (96-hours)
Wahoo, Nebraska
Miles
0 5 10 20
Kilometers
0 10 20 40 60
Coordinate system: GCS North American 1983
Scale: 1:976,461
Melsta/AWA March 1, 2007

Ritter, IA June 7, 1953
Storm Type: MCC

Storm Name:	**Ritter, IA**
Storm Date:	**07-Jun-1953**
AWA Analysis Date:	**12/2/2008**

Storm Adjustment for Nebraska Grid Point 10

Temporal Transposition Date **30-Jun**

	Lat	Long
Storm center location	**43.24 N**	**95.82 W**
Storm Rep dew point location	**37.82 N**	**95.82 W**
Transposition dewpoint location	**35.33 N**	**97.00 W**
Basin location	**41.25 N**	**96.66 W**

Moisture Inflow Direction:	**S @ 375**	miles
Basin Elevation	**1,300**	feet
Storm Elevation	**1,400**	feet
Storm Duration	**6hr**	feet

The storm representative dew point is	**74.0 F**	with total precipitable water above sea level of			**2.73**	inches.
The in-place maximum dew point is	**82.0 F**	with total precipitable water above sea level of			**3.92**	inches.
The transpositioned maximum dew point is	**81.5 F**	with total precipitable water above sea level of			**3.84**	inches.
The in-place storm elevation is	**1,400**	which subtracts	**0.34**	inches of precipitable water at	**74.0 F**	
The in-place storm elevation is	**1,400**	which subtracts	**0.44**	inches of precipitable water at	**82.0 F**	
The transposition basin elevation at	**1,300**	which subtracts	**0.395**	inches of precipitable water at	**81.5 F**	
The inflow barrier/basin elevation height is	**1,300**	which subtracts	**0.395**	inches of precipitable water at	**81.5 F**	

The in-place storm maximization factor is	**1.46**
The transposition/elevation to basin factor is	**0.99**
The barrier adjustment factor is	**1.00**
The total adjustment factor is	**1.44**

Notes: DAD values taken from USACE MR 10-8 (HMB 20)

Observed Storm Depth-Area-Duration

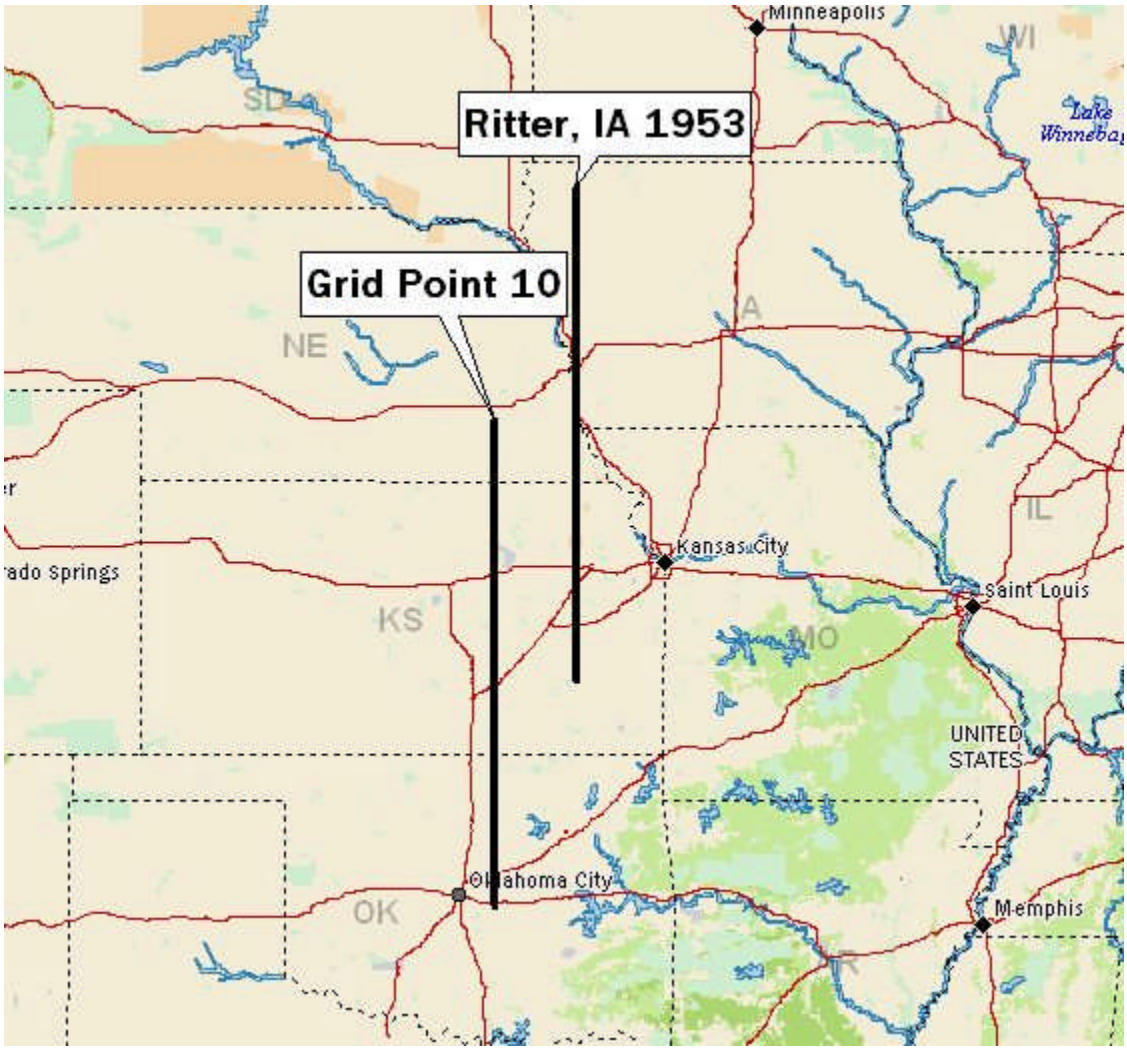
	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**9.1**	**10.5**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
100 sq miles	**7.4**	**9.4**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
200 sq miles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
500 sq miles	**6.5**	**8.5**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
1000 sq miles	**6.1**	**7.9**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
5000 sq miles	**4.4**	**5.9**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
10000 sq miles	**3.5**	**4.8**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
20000 sq miles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Adjusted Storm Depth-Area-Duration

	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**13.1**	**15.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
100 sq miles	**10.7**	**13.5**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
200 sq miles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
500 sq miles	**9.4**	**12.3**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
1000 sq miles	**8.8**	**11.4**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
5000 sq miles	**6.3**	**8.5**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
10000 sq miles	**5.0**	**6.9**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
20000 sq miles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Storm or Storm Center Name	**Ritter, IA**	
Storm Date(s)	7-Jun-1953	
Storm Type	MCS	
Storm Location	43.24 N	95.82 W
Storm Center Elevation	1,400	
Precipitation Total & Duration	11.00 Inches 12-hours USACE MR 10-8 (HMB 20)	
Storm Representative Dewpoint	74.0 F	6hr average, 7° added to USACE storm rep Td based on EPRI and Wanahoo guidance
Storm Representative Dewpoint Location	37.82 N	95.82 W
Maximum Dewpoint	82.0 F	
Moisture Inflow Vector	S @ 375 Miles	
In-place Maximization Factor	1.46	
Temporal Transposition (Date)	30-Jun	
Transposition Dewpoint Location	35.33 N	97.00 W
Transposition Maximum Dewpoint	81.5 F	
Basin Elevation	1,300	
Transposition to Basin Adjustment Factor	0.99	
Higher of Basin Elevation - Inflow Barrier Height	1,300	
Elevation Adjustment Factor	1.00	
Total Adjustment Factor	1.44	

Ritter, IA June 7, 1953 Inflow



Savageton, WY September 27, 1923
Storm Type: Synoptic

Storm Name:	**Savageton, WY**
Storm Date:	**27-Sep-1923**
AWA Analysis Date:	**12/2/2008**

Storm Adjustment for Nebraska Grid Point 13

Temporal Transposition Date **15-Sep**

	Lat	Long
Storm center location	**43.88 N**	**105.93 W**
Storm Rep dew point location	**38.23 N**	**98.90 W**
Transposition dewpoint location	**36.60 N**	**95.97 W**
Basin location	**41.25 N**	**96.66 W**

Moisture Inflow Direction:	**SE @ 530 M**	miles
Basin Elevation	**1,300**	feet
Storm Elevation	**4,800**	feet
Storm Duration	**24hr**	feet

The storm representative dew point is	**74.0 F**	with total precipitable water above sea level of			**2.73**	inches.
The in-place maximum dew point is	**74.5 F**	with total precipitable water above sea level of			**2.79**	inches.
The transpositioned maximum dew point is	**75.0 F**	with total precipitable water above sea level of			**2.85**	inches.
The in-place storm elevation is	**4,800**	which subtracts	**1.02**	inches of precipitable water at	**74.0 F**	
The in-place storm elevation is	**4,800**	which subtracts	**1.03**	inches of precipitable water at	**74.5 F**	
The transposition basin elevation at	**1,300**	which subtracts	**0.32**	inches of precipitable water at	**75.0 F**	
The inflow barrier/basin elevation height is	**1,300**	which subtracts	**0.32**	inches of precipitable water at	**75.0 F**	

The in-place storm maximization factor is	**1.03**
The transposition/elevation to basin factor is	**1.44**
The barrier adjustment factor is	**1.00**
The total adjustment factor is	**1.48**

Notes: DAD values taken from USACE Storm Studies MR 4-23

Observed Storm Depth-Area-Duration

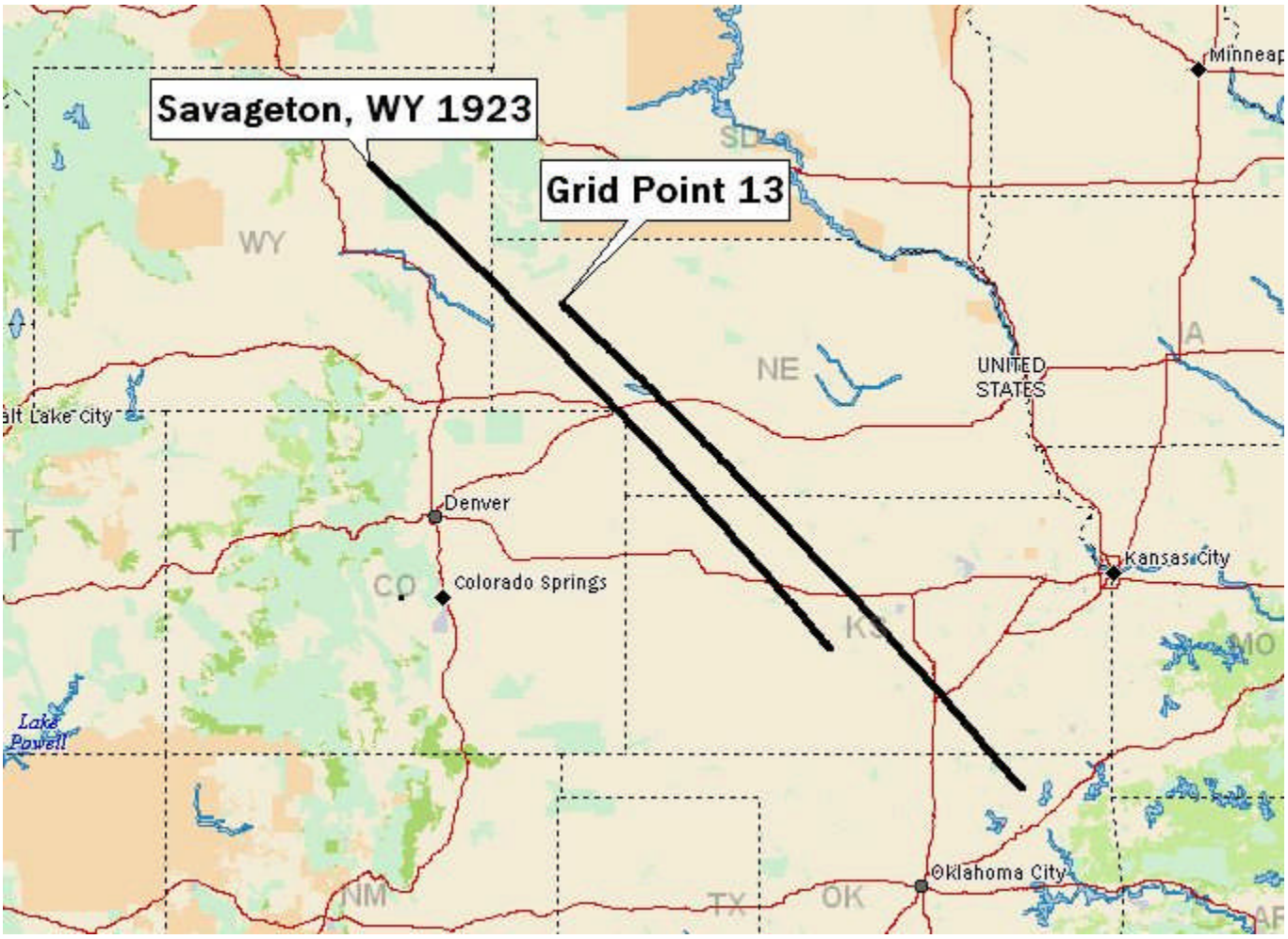
	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**6.0**	**9.1**	**9.3**	**9.5**	**13.0**	**16.5**	**16.9**	**16.9**	**16.9**
100 sq miles	**5.1**	**8.4**	**8.7**	**9.0**	**12.2**	**15.5**	**15.9**	**15.9**	**15.9**
200 sq miles	**4.9**	**8.0**	**8.4**	**8.6**	**11.7**	**14.8**	**15.2**	**15.2**	**15.2**
500 sq miles	**4.3**	**7.1**	**7.5**	**7.7**	**10.4**	**13.2**	**13.4**	**13.6**	**13.7**
1000 sq miles	**3.7**	**6.2**	**6.4**	**6.6**	**9.0**	**11.4**	**11.6**	**11.7**	**11.8**
5000 sq miles	**2.2**	**3.6**	**3.8**	**4.0**	**5.6**	**7.0**	**7.2**	**7.4**	**7.6**
10000 sq miles	**1.6**	**2.5**	**2.7**	**3.0**	**4.2**	**5.3**	**5.7**	**6.1**	**6.3**
20000 sq miles	**1.2**	**1.8**	**2.1**	**2.5**	**3.2**	**3.9**	**4.7**	**5.1**	**5.5**

Adjusted Storm Depth-Area-Duration

	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**8.9**	**13.5**	**13.8**	**14.1**	**19.2**	**24.4**	**25.0**	**25.0**	**25.0**
100 sq miles	**7.5**	**12.4**	**12.9**	**13.3**	**18.1**	**22.9**	**23.5**	**23.5**	**23.5**
200 sq miles	**7.2**	**11.8**	**12.4**	**12.7**	**17.3**	**21.9**	**22.5**	**22.5**	**22.5**
500 sq miles	**6.4**	**10.5**	**11.1**	**11.4**	**15.4**	**19.5**	**19.8**	**20.1**	**20.3**
1000 sq miles	**5.5**	**9.2**	**9.5**	**9.8**	**13.3**	**16.9**	**17.2**	**17.3**	**17.5**
5000 sq miles	**3.3**	**5.3**	**5.6**	**5.9**	**8.3**	**10.4**	**10.7**	**10.9**	**11.2**
10000 sq miles	**2.4**	**3.7**	**4.0**	**4.4**	**6.2**	**7.8**	**8.4**	**9.0**	**9.3**
20000 sq miles	**1.8**	**2.7**	**3.1**	**3.7**	**4.7**	**5.8**	**7.0**	**7.5**	**8.1**

Storm or Storm Center Name	**Savageton, WY**	
Storm Date(s)	27-Sep-1923	
Storm Type	Synoptic-Thunderstorms-Low Pressure, Moist Southeast Flow	
Storm Location	43.88 N	105.93 W
Storm Center Elevation	4,800	
Precipitation Total & Duration	17.1 Inches 48-hours USACE Storm Studies MR 4-23	
Storm Representative Dewpoint	74.0 F	24hr average Added 2° to Td in accordance with EPRI accepted procedures for Synoptic storm events
Storm Representative Dewpoint Location	38.23 N	98.90 W
Maximum Dewpoint	74.5 F	
Moisture Inflow Vector	SE @ 530 Miles	
In-place Maximization Factor	1.03	
Temporal Transposition (Date)	15-Sep	
Transposition Dewpoint Location	36.60 N	95.97 W
Transposition Maximum Dewpoint	75.0 F	
Basin Elevation	1,300	
Transposition to Basin Adjustment Factor	1.44	
Higher of Basin Elevation - Inflow Barrier Height	1,300	
Elevation Adjustment Factor	1.00	
Total Adjustment Factor	1.48	

Savageton, WY September 27, 1923 Inflow



WAR DEPARTMENT — CORPS OF ENGINEERS, U. S. ARMY

STORM STUDIES – PERTINENT DATA SHEET

LOCATION MAP

Storm of 27 Sept.-1 Oct. 1923
Assignment MR 4-23
Location Mont., N. D., S.D., Wyo.
Study Prepared by:
Missouri River Division
Omaha District Office

Part I Reviewed by H. M. Sec. of Weather Bureau, 8/21/45
Part II Approved by Office, Chief of Engineers for Distribution of Factual Data, 10/15/46
Remarks: Center at Savageton, Wyoming

Thiessen SE @ 550

DATA AND COMPUTATIONS COMPILED

PART I

Preliminary isohyetal map, in 1 sheet, scale 1:2,500,000

Precipitation data and mass curves:	(Number of Sheets)
Form 5001-C (Hourly precip. data)	9
Form 5001-B (24-hour " ")	22
Form 5001-D (" " " ")	–
Misc. precip. records, meteorological data, etc.	8
Form 5002 (Mass rainfall curves)	23

PART II

Final isohyetal maps, in 1 sheet, scale 1:1,000,000

Data and computation sheets:	
Form S-10 (Data from mass rainfall curves)	4
Form S-11 (Depth-area data from isohyetal map)	1
Form S-12 (Maximum depth-duration data)	22
Maximum duration-depth-area curves	1
Data relating to periods of maximum rainfall	2

MAXIMUM AVERAGE DEPTH OF RAINFALL IN INCHES

Area in Sq. Mi.	Duration of Rainfall in Hours										
	6	12	18	24	30	36	48	60	72	96	108
Max. Station	6.8	9.3	9.5	9.7	13.6	16.7	17.1	17.1	17.1	17.1	17.1
10	6.0	9.1	9.3	9.5	13.0	16.5	16.9	16.9	16.9	16.9	16.9
100	5.1	8.4	8.7	9.0	12.2	15.5	15.9	15.9	15.9	15.9	15.9
200	4.9	8.0	8.4	8.6	11.7	14.8	15.2	15.2	15.2	15.2	15.2
500	4.3	7.1	7.5	7.7	10.4	13.2	13.4	13.6	13.7	13.7	13.7
1,000	3.7	6.2	6.4	6.6	9.0	11.4	11.6	11.7	11.8	12.0	12.0
2,000	3.0	5.0	5.3	5.5	7.5	9.5	9.7	9.8	9.9	10.1	10.1
5,000	2.2	3.6	3.8	4.0	5.6	7.0	7.2	7.4	7.6	8.1	8.2
10,000	1.6	2.5	2.7	3.0	4.2	5.3	5.7	6.1	6.3	6.9	7.0
20,000	1.2	1.8	2.1	2.5	3.2	3.9	4.7	5.1	5.5	6.0	6.0
50,000	0.8	1.5	1.8	2.1	2.7	3.1	3.7	4.0	4.3	4.7	4.8
95,000	0.6	1.1	1.4	1.7	2.1	2.3	2.8	3.1	3.3	3.7	3.8

Form S-2

WAR DEPARTMENT — CORPS OF ENGINEERS, U. S. ARMY

STORM STUDIES – ISOHYETAL MAP

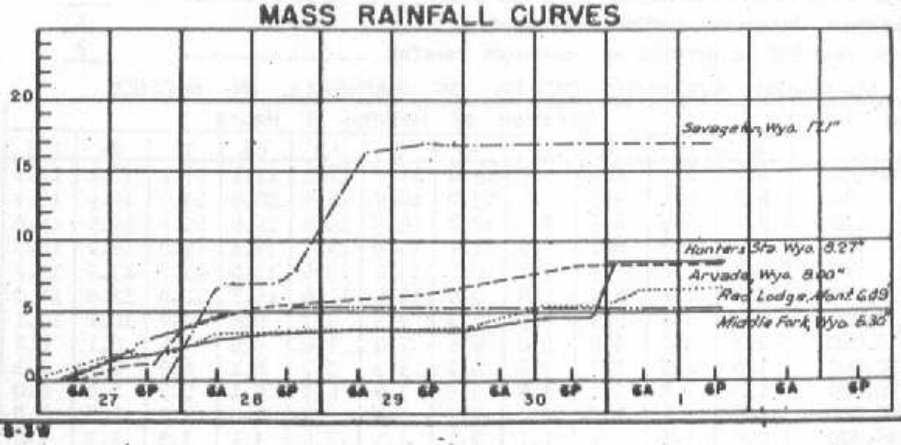
Storm of September 27-October 1, 1923 Assignment MR 4-23

Study Prepared by: Omaha, Nebr. District
Missouri River Division

Storm Period 108 hours
from 1 AM Sept. 27
to 1 PM Oct. 1

SCALE
1:9,000,000
Polyconic Projection

MASS RAINFALL CURVES



FORM 5-38

Springbrook, MT June 17, 1921
Storm Type: Synoptic

Storm Name:	**Springbrook, MT**
Storm Date:	**17-Jun-1921**
AWA Analysis Date:	**12/2/2008**

Storm Adjustment for Nebraska Grid Point 10

Temporal Transposition Date **30-Jun**

	Lat	Long
Storm center location	**47.25 N**	**104.52 W**
Storm Rep dew point location	**44.090 N**	**95.196 W**
Transposition dewpoint location	**35.59 N**	**87.68 W**
Basin location	**41.25 N**	**96.66 W**

Moisture Inflow Direction:	**ESE @ 500**	miles
Basin Elevation	**1,300**	feet
Storm Elevation	**2,327**	feet
Storm Duration	**Added 2°**	feet

The storm representative dew point is	**73.0 F**	with total precipitable water above sea level of			**2.60**	inches.
The in-place maximum dew point is	**78.0 F**	with total precipitable water above sea level of			**3.29**	inches.
The transpositioned maximum dew point is	**78.0 F**	with total precipitable water above sea level of			**3.29**	inches.
The in-place storm elevation is	**2,327**	which subtracts	**0.52**	inches of precipitable water at	**73.0 F**	
The in-place storm elevation is	**2,327**	which subtracts	**0.61**	inches of precipitable water at	**78.0 F**	
The transposition basin elevation at	**1,300**	which subtracts	**0.36**	inches of precipitable water at	**78.0 F**	
The inflow barrier/basin elevation height is	**1,300**	which subtracts	**0.36**	inches of precipitable water at	**78.0 F**	

The in-place storm maximization factor is	**1.29**
The transposition/elevation to basin factor is	**1.09**
The barrier adjustment factor is	**1.00**
The total adjustment factor is	**1.41**

Notes: DAD values taken from USACE Storm Studies MR 4-21

Observed Storm Depth-Area-Duration

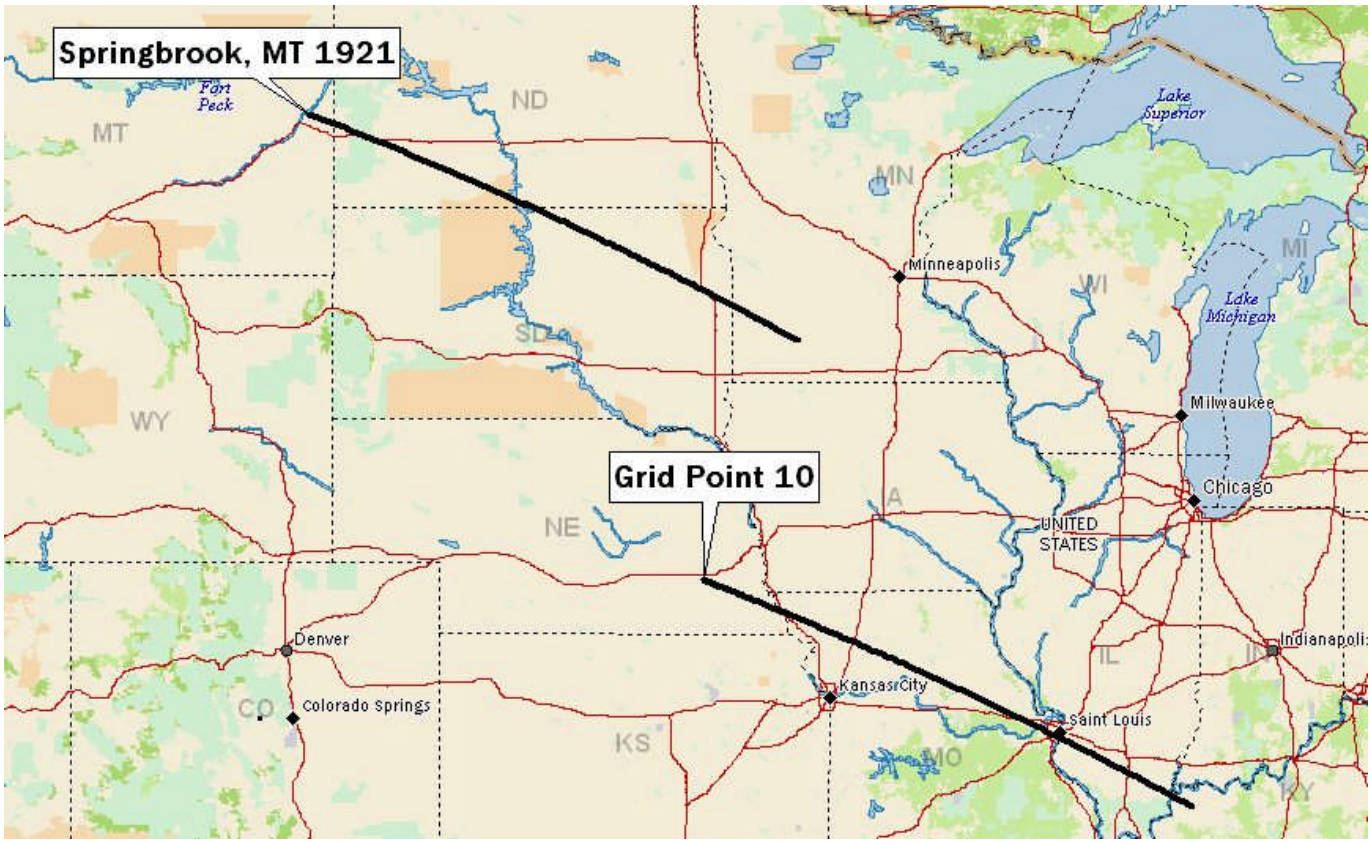
	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**10.5**	**11.7**	**12.9**	**13.3**	**13.4**	**13.4**	**14.2**	**14.5**	**14.6**
100 sq miles	**8.5**	**11.1**	**12.6**	**13.0**	**13.3**	**13.3**	**14.1**	**14.2**	**14.4**
200 sq miles	**8.3**	**10.8**	**12.3**	**12.7**	**13.0**	**13.0**	**13.8**	**13.9**	**14.2**
500 sq miles	**7.9**	**10.3**	**11.6**	**12.0**	**12.3**	**12.3**	**13.0**	**13.2**	**13.4**
1000 sq miles	**7.4**	**9.6**	**10.8**	**11.3**	**11.5**	**11.5**	**12.1**	**12.3**	**12.5**
5000 sq miles	**4.9**	**6.2**	**7.3**	**7.7**	**8.0**	**8.0**	**9.0**	**9.3**	**9.5**
10000 sq miles	**3.0**	**4.3**	**5.1**	**5.6**	**5.8**	**5.8**	**7.3**	**7.6**	**7.7**
20000 sq miles	**1.6**	**2.7**	**3.4**	**3.9**	**4.1**	**4.2**	**5.2**	**5.5**	**5.8**

Adjusted Storm Depth-Area-Duration

	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**14.8**	**16.5**	**18.2**	**18.7**	**18.9**	**18.9**	**20.0**	**20.4**	**20.6**
100 sq miles	**12.0**	**15.6**	**17.7**	**18.3**	**18.7**	**18.7**	**19.9**	**20.0**	**20.3**
200 sq miles	**11.7**	**15.2**	**17.3**	**17.9**	**18.3**	**18.3**	**19.4**	**19.6**	**20.0**
500 sq miles	**11.1**	**14.5**	**16.3**	**16.9**	**17.3**	**17.3**	**18.3**	**18.6**	**18.9**
1000 sq miles	**10.4**	**13.5**	**15.2**	**15.9**	**16.2**	**16.2**	**17.0**	**17.3**	**17.6**
5000 sq miles	**6.9**	**8.7**	**10.3**	**10.8**	**11.3**	**11.3**	**12.7**	**13.1**	**13.4**
10000 sq miles	**4.2**	**6.1**	**7.2**	**7.9**	**8.2**	**8.2**	**10.3**	**10.7**	**10.8**
20000 sq miles	**2.3**	**3.8**	**4.8**	**5.5**	**5.8**	**5.9**	**7.3**	**7.7**	**8.2**

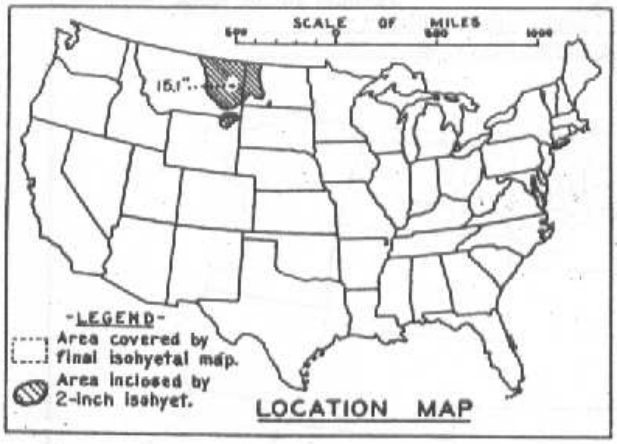
Storm or Storm Center Name	**Springbrook, MT**		
Storm Date(s)	17-Jun-1921		
Storm Type	Synoptic		
Storm Location	47.25 N	104.52 W	
Storm Center Elevation	2,327		
Precipitation Total & Duration	14.6 Inches 72-hours USACE Storm Studies MR 4-21		
Storm Representative Dewpoint	73.0 F	24hr average	Added 2° to Td in accordance with EPRI accepted procedures
Storm Representative Dewpoint Location	44.090 N	95.196 W	for Synoptic storm events for 24hr ave
Maximum Dewpoint	78.0 F		
Moisture Inflow Vector	ESE @ 500 Miles		
In-place Maximization Factor	1.29		
Temporal Transposition (Date)	30-Jun		
Transposition Dewpoint Location	35.59 N	87.68 W	
Transposition Maximum Dewpoint	78.0 F		
Basin Elevation	1,300		
Transposition to Basin Adjustment Factor	1.09		
Higher of Basin Elevation - Inflow Barrier Height	1,300		
Elevation Adjustment Factor	1.00		
Total Adjustment Factor	1.41		

Springbrook, MT June 17, 1921 Inflow



WAR DEPARTMENT — CORPS OF ENGINEERS, U. S. ARMY

STORM STUDIES - PERTINENT DATA SHEET



LOCATION MAP

Storm of 17-21 June 1921
Assignment M R 4- 21
Location Montana, North Dakota
Study Prepared by:
Missouri River Division
Omaha District Office

Part I Reviewed by H. M. Sec. of Weather Bureau, 4/2/45
Part II Approved by Office, Chief of Engineers for Distribution of Factual Data, 7/16/46
Remarks: Center at Springbrook, Montana

DATA AND COMPUTATIONS COMPILED

PART I

Preliminary isohyetal map, in 1 sheet, scale 1:2,500,000

Precipitation data and mass curves: (Number of Sheets)

- Form 5001-C (Hourly precip. data) 4
- Form 5001-B (24-hour " ") ..... -
- Form 5001-D (" " " ") 5
- Misc. precip. records, meteorological data, etc. 11
- Form 5002 (Mass rainfall curves) 11

PART II

Final isohyetal maps, in 1 sheet, scale 1:1,000,000

Data and computation sheets:

- Form S-10 (Data from mass rainfall curves) 2
- Form S-11 (Depth-area data from isohyetal map) 1
- Form S-12 (Maximum depth-duration data) 10
- Maximum duration-depth-area curves 1
- Data relating to periods of maximum rainfall 2

MAXIMUM AVERAGE DEPTH OF RAINFALL IN INCHES

Area in Sq. Mi.	Duration of Rainfall in Hours										
	6	12	18	24	30	36	48	60	72	96	108
10	10.5	11.7	12.9	13.3	13.4	13.4	14.2	14.5	14.6	14.9	15.1
100	8.5	11.1	12.6	13.0	13.3	13.3	14.1	14.2	14.4	14.9	15.1
200	8.3	10.8	12.3	12.7	13.0	13.0	13.8	13.9	14.2	14.6	14.8
500	7.9	10.3	11.6	12.0	12.3	12.3	13.0	13.2	13.4	13.8	14.0
1,000	7.4	9.6	10.8	11.3	11.5	11.5	12.1	12.3	12.5	12.8	13.1
2,000	6.6	8.5	9.7	10.1	10.4	10.4	11.0	11.2	11.4	11.7	11.9
5,000	4.9	6.2	7.3	7.7	8.0	8.0	9.0	9.3	9.5	9.8	9.9
10,000	3.0	4.3	5.1	5.6	5.8	5.8	7.3	7.6	7.7	7.9	8.0
20,000	1.6	2.7	3.4	3.9	4.1	4.2	5.2	5.5	5.8	6.0	6.0
30,000	1.0	1.8	2.5	2.9	3.2	3.4	4.1	4.6	5.1	5.3	5.3
52,600	0.6	1.0	1.5	1.8	2.1	2.3	3.0	3.6	4.0	4.2	4.2

Form S-2

WAR DEPARTMENT — CORPS OF ENGINEERS, U. S. ARMY

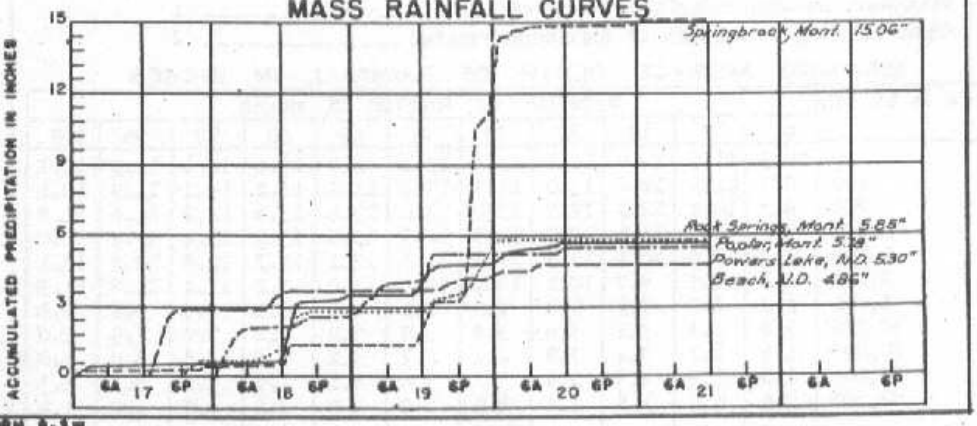
STORM STUDIES – ISOHYETAL MAP

Storm of June 17-21, 1921 — Assignment MR 4-21

Study Prepared by: Omaha, Nebr. District
Missouri River Division

Storm Period 108 hours
from 12 M June 16
to 12 N June 21

MASS RAINFALL CURVES



FORM 8-SW

Stanton, NE June 10, 1944
Storm Type: MCC

Storm Name:	**Stanton, NE**
Storm Date:	**10-Jun-1944**
AWA Analysis Date:	**12/2/2008**

Storm Adjustment for Nebraska Grid Point 10

Temporal Transposition Date **30-Jun**

	Lat	Long
Storm center location	**41.87 N**	**97.05 W**
Storm Rep dew point location	**40.18 N**	**96.14 W**
Transposition dewpoint location	**39.06 N**	**96.091 W**
Basin location	**41.25 N**	**96.66 W**

Moisture Inflow Direction:	**SSE @ 125**	miles
Basin Elevation	**1,300**	feet
Storm Elevation	**1,700**	feet
Storm Duration	**6hr**	feet

The storm representative dew point is	**77.0 F**	with total precipitable water above sea level of			**3.14** inches.
The in-place maximum dew point is	**82.5 F**	with total precipitable water above sea level of			**4.00** inches.
The transpositioned maximum dew point is	**82.5 F**	with total precipitable water above sea level of			**4.00** inches.
The in-place storm elevation is	**1,700**	which subtracts	**0.44**	inches of precipitable water at	**77.0 F**
The in-place storm elevation is	**1,700**	which subtracts	**0.525**	inches of precipitable water at	**82.5 F**
The transposition basin elevation at	**1,300**	which subtracts	**0.405**	inches of precipitable water at	**82.5 F**
The inflow barrier/basin elevation height is	**1,300**	which subtracts	**0.405**	inches of precipitable water at	**82.5 F**

The in-place storm maximization factor is	**1.29**
The transposition/elevation to basin factor is	**1.03**
The barrier adjustment factor is	**1.00**
The total adjustment factor is	**1.33**

Notes: DAD values taken from USACE Storm Studies MR 6-15

Observed Storm Depth-Area-Duration

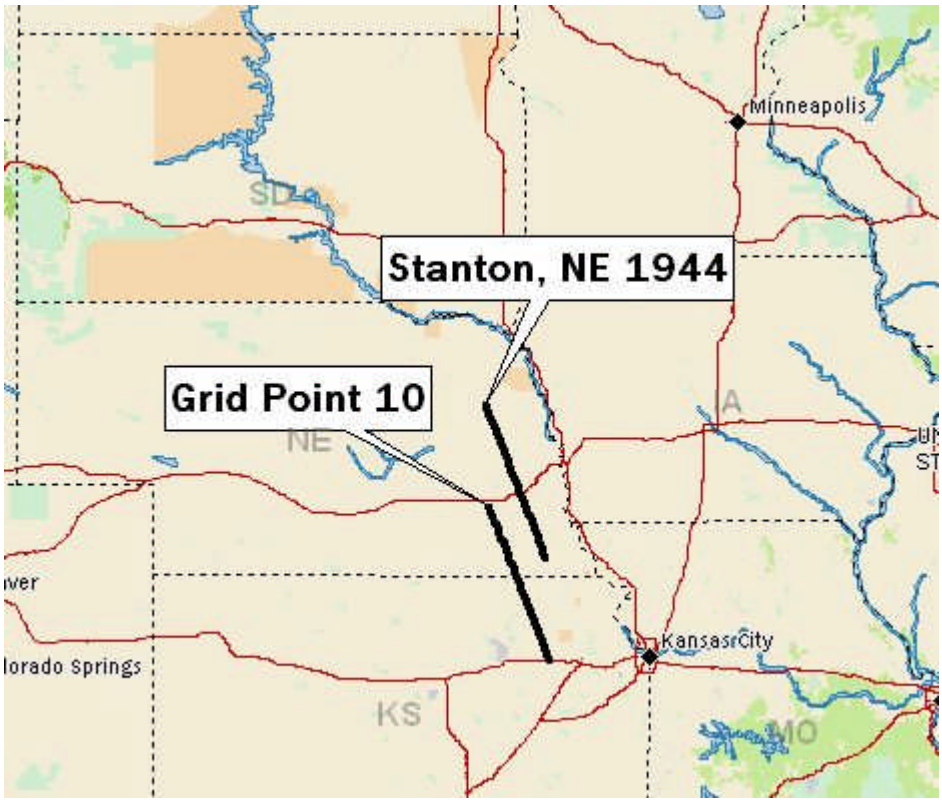
	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**13.4**	**15.3**	**15.3**	**15.3**	**15.3**	**15.3**	**16.2**	**16.4**	**16.7**
100 sq miles	**11.7**	**13.6**	**13.6**	**13.6**	**13.6**	**13.7**	**14.8**	**14.9**	**15.1**
200 sq miles	**11.1**	**12.9**	**12.9**	**12.9**	**12.9**	**13.1**	**14.1**	**14.3**	**14.4**
500 sq miles	**9.8**	**11.3**	**11.5**	**11.5**	**11.5**	**11.6**	**12.5**	**12.7**	**12.8**
1000 sq miles	**7.8**	**9.0**	**9.3**	**9.3**	**9.3**	**9.4**	**10.1**	**10.4**	**10.4**
5000 sq miles	**3.4**	**4.0**	**4.2**	**4.6**	**4.7**	**4.9**	**5.3**	**5.5**	**5.7**
10000 sq miles	**2.2**	**2.5**	**2.7**	**3.5**	**3.9**	**4.1**	**4.5**	**4.7**	**4.9**
20000 sq miles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Adjusted Storm Depth-Area-Duration

	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**17.8**	**20.4**	**20.4**	**20.4**	**20.4**	**20.4**	**21.6**	**21.8**	**22.2**
100 sq miles	**15.6**	**18.1**	**18.1**	**18.1**	**18.1**	**18.2**	**19.7**	**19.8**	**20.1**
200 sq miles	**14.8**	**17.2**	**17.2**	**17.2**	**17.2**	**17.4**	**18.8**	**19.0**	**19.2**
500 sq miles	**13.0**	**15.0**	**15.3**	**15.3**	**15.3**	**15.4**	**16.6**	**16.9**	**17.0**
1000 sq miles	**10.4**	**12.0**	**12.4**	**12.4**	**12.4**	**12.5**	**13.4**	**13.8**	**13.8**
5000 sq miles	**4.5**	**5.3**	**5.6**	**6.1**	**6.3**	**6.5**	**7.1**	**7.3**	**7.6**
10000 sq miles	**2.9**	**3.3**	**3.6**	**4.7**	**5.2**	**5.5**	**6.0**	**6.3**	**6.5**
20000 sq miles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Storm or Storm Center Name	**Stanton, NE**	
Storm Date(s)	10-Jun-1944	
Storm Type	MCC	
Storm Location	41.87 N	97.05 W
Storm Center Elevation	1,700	
Precipitation Total & Duration	17.3 Inches 60-hours USACE Storm Studies MR 6-15	
Storm Representative Dewpoint	77.0 F	6hr average, 7° added to USACE storm rep Td based on EPRI and Wanahoo guidance
Storm Representative Dewpoint Location	40.18 N	96.14 W
Maximum Dewpoint	82.5 F	
Moisture Inflow Vector	SSE @ 125 Miles	
In-place Maximization Factor	1.29	
Temporal Transposition (Date)	30-Jun	
Transposition Dewpoint Location	39.06 N	96.091 W
Transposition Maximum Dewpoint	82.5 F	
Basin Elevation	1,300	
Transposition to Basin Adjustment Factor	1.03	
Higher of Basin Elevation - Inflow Barrier Height	1,300	
Elevation Adjustment Factor	1.00	
Total Adjustment Factor	1.33	

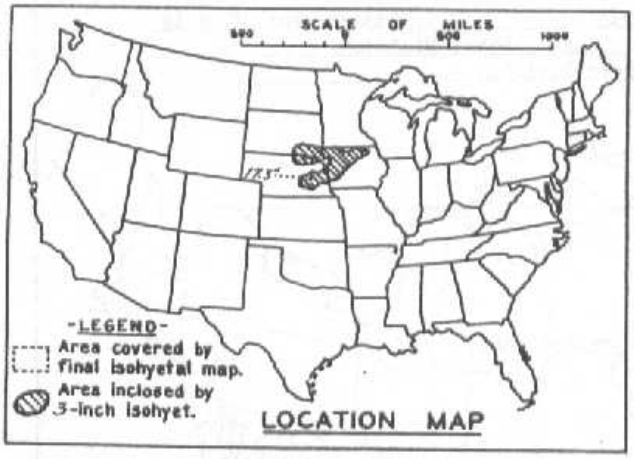
Stanton, NE June 10, 1944 Inflow



DEPARTMENT OF THE ARMY

CORPS OF ENGINEERS

STORM STUDIES - PERTINENT DATA SHEET



LOCATION MAP

Storm of 10-13 June 1944
Assignment MR 6-15
Location Ia., Nebr., S. Dak.
Study Prepared by:
Missouri River Division
Omaha District Office

Part I Reviewed by H. M. Sec. of Weather Bureau, 8/7/46
Part II Approved by Office, Chief of Engineers for Distribution of Factual Data, 2/10/48
Remarks: Center near Stanton, Nebr.
Dewpt. 70°- Ref. Pt. 125 SSE Grid D-16

DATA AND COMPUTATIONS COMPILED

PART I

Preliminary isohyetal map, in 2 sheets, scale 1:500,000

Precipitation data and mass curves:

	(Number of Sheets)
Form 5001-C (Hourly precip. data)	56
Form 5001-B (24-hour " ")	-
Form 5001-D (" " " ")	19
Misc. precip. records, meteorological data, etc.	11
Form 5002 (Mass rainfall curves)	34

PART II

Final isohyetal maps, in 1 sheet, scale 500,000

Data and computation sheets:

Form S-10 (Data from mass rainfall curves)	3
Form S-11 (Depth-area data from isohyetal map)	2
Form S-12 (Maximum depth-duration data)	13
Maximum duration-depth-area curves	1
Data relating to periods of maximum rainfall	5

MAXIMUM AVERAGE DEPTH OF RAINFALL IN INCHES

Area in Sq. Mi.	Duration of Rainfall in Hours										
	6	12	18	24	30	36	48	60	72	78	
Max.Sta.	15.5	15.8	15.8	15.8	15.8	15.8	16.8	17.3	17.3	17.3	
10	13.4	15.3	15.3	15.3	15.3	15.3	16.2	16.4	16.7	16.7	
100	11.7	13.6	13.6	13.6	13.6	13.7	14.8	14.9	15.1	15.1	
200	11.1	12.9	12.9	12.9	12.9	13.1	14.1	14.3	14.4	14.4	
500	9.8	11.3	11.5	11.5	11.5	11.6	12.5	12.7	12.8	12.8	
1,000	7.8	9.0	9.3	9.3	9.3	9.4	10.1	10.4	10.4	10.4	
2,000	5.9	6.9	7.1	7.1	7.2	7.3	7.8	8.1	8.1	8.1	
5,000	3.4	4.0	4.2	4.6	4.7	4.9	5.3	5.5	5.7	5.8	
10,000	2.2	2.5	2.7	3.5	3.9	4.1	4.5	4.7	4.9	5.0	
16,000	1.8	2.0	2.2	2.9	3.5	3.7	4.1	4.3	4.5	4.6	

Form S-2

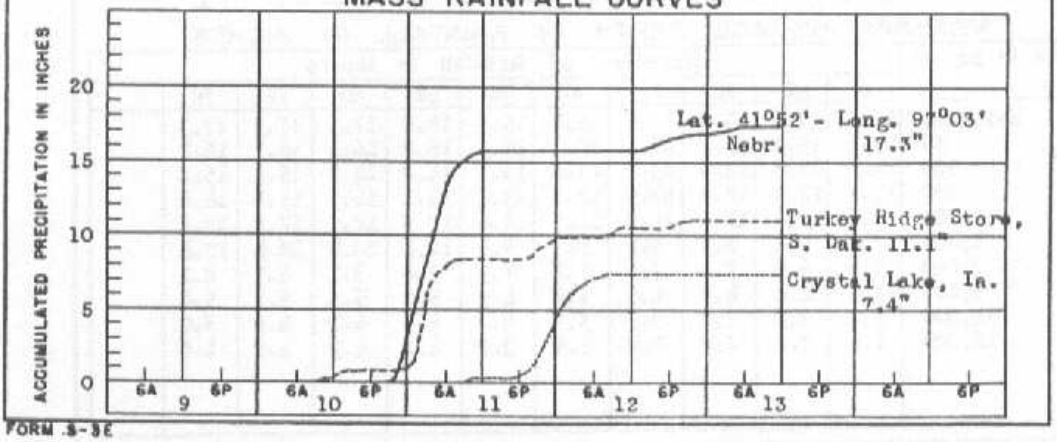
DEPARTMENT OF THE ARMY — CORPS OF ENGINEERS

STORM STUDIES - ISOHYETAL MAP

Storm of 10-13 June 1944 Assignment MR 6-15

Study Prepared by: Omaha, Nebr. District
Missouri River Division

MASS RAINFALL CURVES



FORM .S-5E

Tomah, WI August 17, 1990
Storm Type: MCC

Storm Name:	**Tomah, WI**
Storm Date:	**17-Aug-1990**
AWA Analysis Date:	**12/2/2008**

Storm Adjustment for Nebraska Grid Point 10

Temporal Transposition Date **1-Aug**

	Lat	Long
Storm center location	**43.98 N**	**90.50 W**
Storm Rep dew point location	**42.42 N**	**92.59 W**
Transposition dewpoint location	**39.19 N**	**99.09 W**
Basin location	**41.25 N**	**96.66 W**

Moisture Inflow Direction:	**SW @ 150**	miles
Basin Elevation	**1,300**	feet
Storm Elevation	**1,000**	feet
Storm Duration	**6hr**	feet

The storm representative dew point is	**81.0 F**	with total precipitable water above sea level of			**3.60**	inches.
The in-place maximum dew point is	**82.0 F**	with total precipitable water above sea level of			**3.92**	inches.
The transpositioned maximum dew point is	**82.5 F**	with total precipitable water above sea level of			**4.00**	inches.
The in-place storm elevation is	**1,000**	which subtracts	**0.3**	inches of precipitable water at	**81.0 F**	
The in-place storm elevation is	**1,000**	which subtracts	**0.31**	inches of precipitable water at	**82.0 F**	
The transposition basin elevation at	**1,300**	which subtracts	**0.405**	inches of precipitable water at	**82.5 F**	
The inflow barrier/basin elevation height is	**1,300**	which subtracts	**0.405**	inches of precipitable water at	**82.5 F**	

The in-place storm maximization factor is	**1.09**
The transposition/elevation to basin factor is	**1.00**
The barrier adjustment factor is	**1.00**
The total adjustment factor is	**1.09**

Notes: DAD values taken from EPRI Storm 25

Observed Storm Depth-Area-Duration

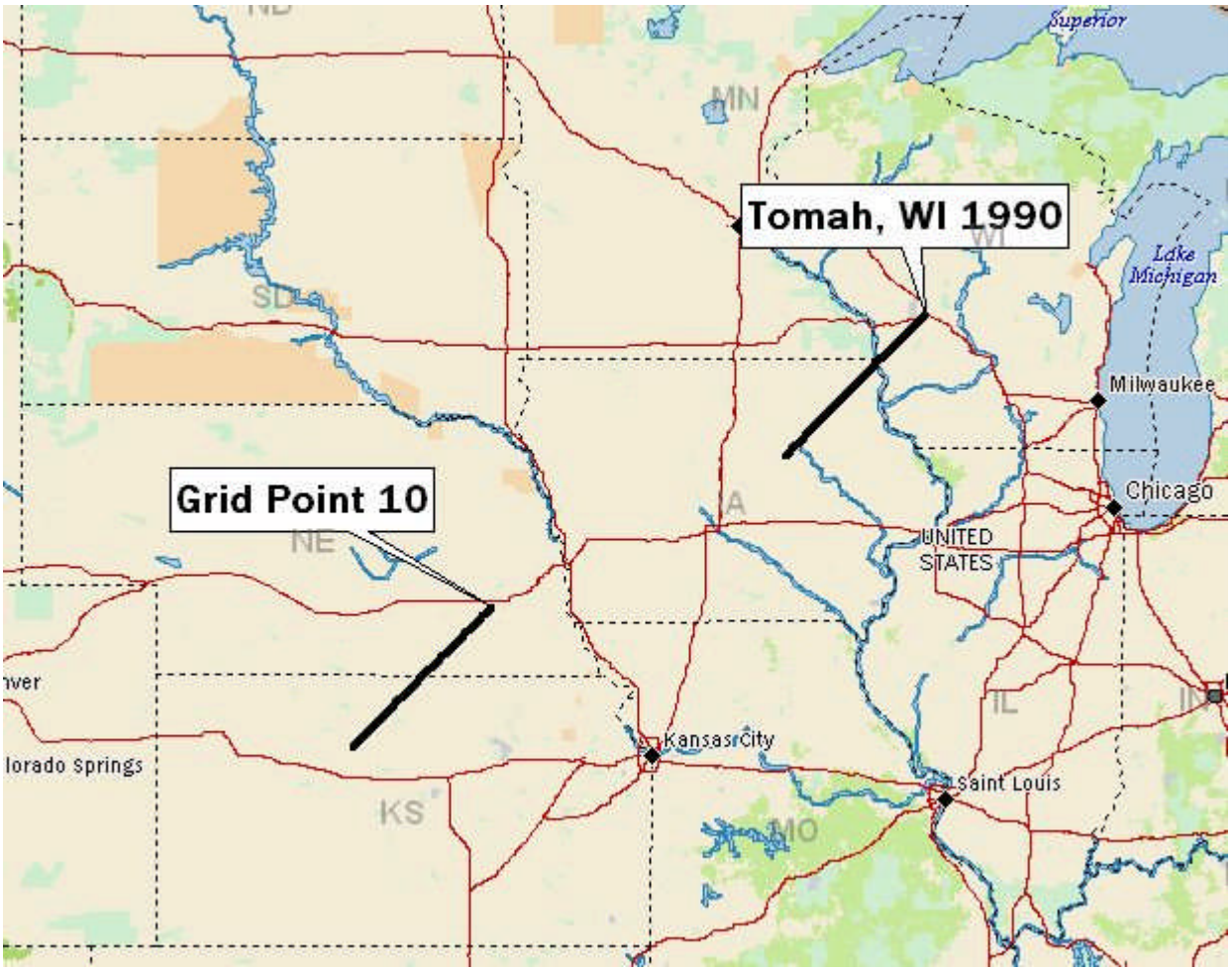
	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**9.2**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
100 sq miles	**7.6**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
200 sq miles	**7.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
500 sq miles	**6.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
1000 sq miles	**5.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
5000 sq miles	**2.9**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
10000 sq miles	**2.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
20000 sq miles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Adjusted Storm Depth-Area-Duration

	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**10.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
100 sq miles	**8.3**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
200 sq miles	**7.6**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
500 sq miles	**6.5**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
1000 sq miles	**5.4**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
5000 sq miles	**3.2**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
10000 sq miles	**2.2**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
20000 sq miles	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Storm or Storm Center Name	**Tomah, WI**	
Storm Date(s)	17-Aug-1990	
Storm Type	MCC	
Storm Location	43.98 N	90.50 W
Storm Center Elevation	1,000	
Precipitation Total & Duration	9.17 Inches 4-hours EPRI Warm Season Storm Number 25	
Storm Representative Dewpoint	81.0 F	6hr average, 7° added to USACE storm rep Td based on ERPI and Wanahoo guidance
Storm Representative Dewpoint Location	42.42 N	92.59 W
Maximum Dewpoint	82.0 F	
Moisture Inflow Vector	SW @ 150 Miles	
In-place Maximization Factor	1.09	
Temporal Transposition (Date)	1-Aug	
Transposition Dewpoint Location	39.19 N	99.09 W
Transposition Maximum Dewpoint	82.5 F	
Basin Elevation	1,300	
Transposition to Basin Adjustment Factor	1.00	
Higher of Basin Elevation - Inflow Barrier Height	1,300	
Elevation Adjustment Factor	1.00	
Total Adjustment Factor	1.09	

Tomah, WI August 17, 1990 Inflow



Warner, OK May 6, 1943
Storm Type: Synoptic

Storm Name:	**Warner, OK**
Storm Date:	**06-May-1943**
AWA Analysis Date:	**12/2/2008**

Storm Adjustment for Nebraska Grid Point 5

Temporal Transposition Date **24-May**

	Lat	Long
Storm center location	**35.49 N**	**95.30 W**
Storm Rep dew point location	**32.48 N**	**93.83 W**
Transposition dewpoint location	**36.24 N**	**93.53 W**
Basin location	**41.20 N**	**96.42 W**

Moisture Inflow Direction:	**SSE @ 225**	miles
Basin Elevation	**1,300**	feet
Storm Elevation	**600**	feet
Storm Duration	**24hr**	feet

The storm representative dew point is	**72.0 F**	with total precipitable water above sea level of			**2.47**	inches.
The in-place maximum dew point is	**76.5 F**	with total precipitable water above sea level of			**3.07**	inches.
The transpositioned maximum dew point is	**75.0 F**	with total precipitable water above sea level of			**2.85**	inches.
The in-place storm elevation is	**600**	which subtracts	**0.14**	inches of precipitable water at	**72.0 F**	
The in-place storm elevation is	**600**	which subtracts	**0.16**	inches of precipitable water at	**76.5 F**	
The transposition basin elevation at	**1,300**	which subtracts	**0.32**	inches of precipitable water at	**75.0 F**	
The inflow barrier/basin elevation height is	**1,300**	which subtracts	**0.32**	inches of precipitable water at	**75.0 F**	

The in-place storm maximization factor is	**1.25**
The transposition/elevation to basin factor is	**0.87**
The barrier adjustment factor is	**1.00**
The total adjustment factor is	**1.09**

Notes: DAD values taken from USACE SW 2-20

Observed Storm Depth-Area-Duration

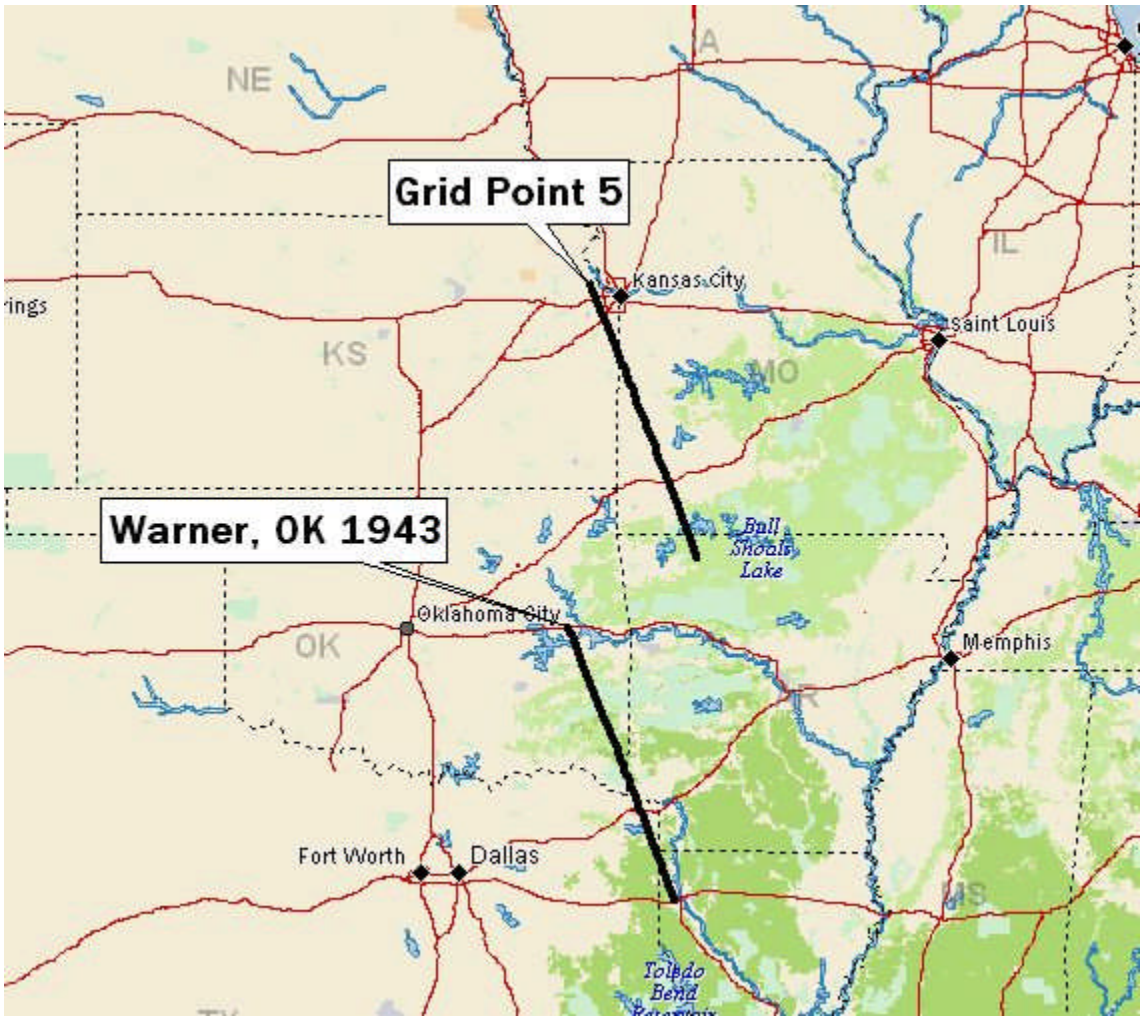
	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**9.9**	**12.3**	**14.6**	**17.2**	**19.5**	**21.5**	**24.4**	**24.9**	**24.9**
100 sq miles	**8.7**	**10.8**	**12.4**	**14.9**	**17.1**	**19.3**	**21.8**	**22.5**	**22.5**
200 sq miles	**7.4**	**9.5**	**11.4**	**13.8**	**16.0**	**18.3**	**20.6**	**21.3**	**21.3**
500 sq miles	**5.4**	**7.6**	**10.0**	**12.3**	**14.5**	**16.7**	**18.6**	**19.4**	**19.4**
1000 sq miles	**4.3**	**6.3**	**9.0**	**11.1**	**13.3**	**15.4**	**17.1**	**18.0**	**18.0**
5000 sq miles	**3.0**	**4.5**	**6.8**	**8.3**	**10.5**	**12.1**	**13.4**	**14.4**	**14.4**
10000 sq miles	**2.6**	**3.9**	**5.8**	**7.2**	**9.1**	**10.4**	**11.7**	**12.6**	**12.6**
20000 sq miles	**2.1**	**3.3**	**4.9**	**6.1**	**7.6**	**8.7**	**10.0**	**10.7**	**10.8**

Adjusted Storm Depth-Area-Duration

	6 Hours	12 Hours	18 Hours	24 Hours	30 Hours	36 Hours	48 Hours	60 Hours	72 Hours
10 sq miles	**10.7**	**13.4**	**15.9**	**18.7**	**21.2**	**23.3**	**26.5**	**27.0**	**27.0**
100 sq miles	**9.4**	**11.7**	**13.5**	**16.2**	**18.6**	**21.0**	**23.7**	**24.4**	**24.4**
200 sq miles	**8.0**	**10.3**	**12.4**	**15.0**	**17.4**	**19.9**	**22.4**	**23.1**	**23.1**
500 sq miles	**5.9**	**8.3**	**10.9**	**13.4**	**15.7**	**18.1**	**20.2**	**21.1**	**21.1**
1000 sq miles	**4.7**	**6.8**	**9.8**	**12.1**	**14.4**	**16.7**	**18.6**	**19.5**	**19.5**
5000 sq miles	**3.3**	**4.9**	**7.4**	**9.0**	**11.4**	**13.1**	**14.6**	**15.6**	**15.6**
10000 sq miles	**2.8**	**4.2**	**6.3**	**7.8**	**9.9**	**11.3**	**12.7**	**13.7**	**13.7**
20000 sq miles	**2.3**	**3.6**	**5.3**	**6.6**	**8.3**	**9.4**	**10.9**	**11.6**	**11.7**

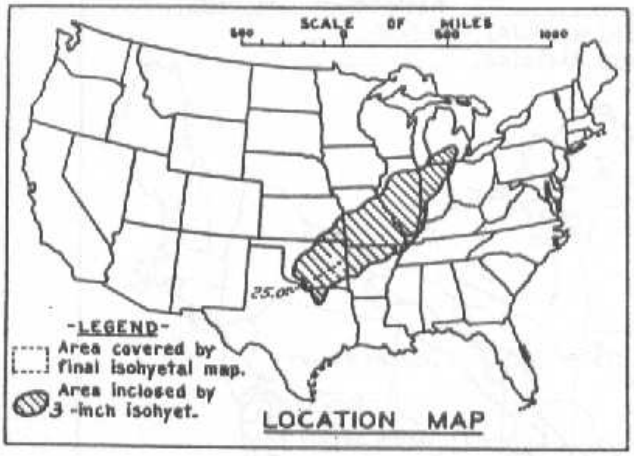
Storm or Storm Center Name	**Warner, OK**	
Storm Date(s)	6-May-1943	
Storm Type	Synoptic	
Storm Location	35.49 N	95.30 W
Storm Center Elevation	600	
Precipitation Total & Duration	25.00 Inches 72-hours USACE SW 2-20	
Storm Representative Dewpoint	72.0 F	24hr average
Storm Representative Dewpoint Location	32.48 N	93.83 W
Maximum Dewpoint	76.5 F	
Moisture Inflow Vector	SSE @ 225 Miles	
In-place Maximization Factor	1.25	
Temporal Transposition (Date)	24-May	
Transposition Dewpoint Location	36.24 N	93.53 W
Transposition Maximum Dewpoint	75.0 F	
Basin Elevation	1,300	
Transposition to Basin Adjustment Factor	0.87	
Higher of Basin Elevation - Inflow Barrier Height	1,300	
Elevation Adjustment Factor	1.00	
Total Adjustment Factor	1.09	

Warner, OK May 6, 1943 Inflow



DEPARTMENT OF THE ARMY — CORPS OF ENGINEERS

STORM STUDIES - PERTINENT DATA SHEET



LOCATION MAP

Storm of 6-12 May 1943
Assignment SW 2-20
Location N.Texas to Great Lakes
Study Prepared by:
Southwestern Division
Tulsa District Office

Part I Reviewed by H. M. Sec. of Weather Bureau, 4-14-45
Part II Approved by Office, Chief of Engineers for Distribution of Factual Data, 7-17-47
Remarks: Center at Warner, Oklahoma
Dewpt. 70° - Ref. Pt. 225 SSE
Grid G-15

DATA AND COMPUTATIONS COMPILED

PART I

Preliminary isohyetal map, in 1 sheet, scale 1:1,000,000

Precipitation data and mass curves: (Number of Sheets)

Form 5001-C (Hourly precip. data)	553
Form 5001-B (24-hour " ")	-
Form 5001-D (" " " ")	178
Misc. precip. records, meteorological data, etc.	80
Form 5002 (Mass rainfall curves)	281

PART II

Final isohyetal maps, in 1 sheet, scale 1:1,000,000

Data and computation sheets:

Form S-10 (Data from mass rainfall curves)	42
Form S-11 (Depth-area data from isohyetal map)	12
Form S-12 (Maximum depth-duration data)	12
Maximum duration-depth-area curves	1
Data relating to periods of maximum rainfall	2

MAXIMUM AVERAGE DEPTH OF RAINFALL IN INCHES

Area in Sq. Mi.	Duration of Rainfall in Hours										120/
	6	12	18	24	30	36	48	60	72	96	144
Max. Station	10.0	12.5	15.0	17.6	20.0	21.8	24.6	25.0	25.0	25.0	25.0
10	9.9	12.3	14.6	17.2	19.5	21.5	24.4	24.9	24.9	24.9	24.9
100	8.7	10.8	12.4	14.9	17.1	19.3	21.8	22.5	22.5	22.5	22.5
200	7.4	9.5	11.4	13.8	16.0	18.3	20.6	21.3	21.3	21.3	21.3
500	5.4	7.6	10.0	12.3	14.5	16.7	18.6	19.4	19.4	19.4	19.4
1,000	4.3	6.3	9.0	11.1	13.3	15.4	17.1	18.0	18.0	18.0	18.0
2,000	3.6	5.4	8.0	9.9	12.1	14.0	15.5	16.5	16.5	16.5	16.5
5,000	3.0	4.5	6.8	8.3	10.5	12.1	13.4	14.4	14.4	14.4	14.4
10,000	2.6	3.9	5.8	7.2	9.1	10.4	11.7	12.6	12.6	12.8	12.8
20,000	2.1	3.3	4.9	6.1	7.6	8.7	10.0	10.7	10.8	11.1	11.1
50,000	1.6	2.5	3.7	4.6	5.7	6.5	7.7	8.1	8.3	8.8	8.9
100,000	1.1	1.9	2.7	3.4	4.2	4.9	5.8	6.2	6.4	7.0	7.3
212,000	0.6	1.1	1.7	2.2	2.6	3.0	3.7	4.2	4.4	5.0	5.5

Form S-2

DEPARTMENT OF THE ARMY — CORPS OF ENGINEERS

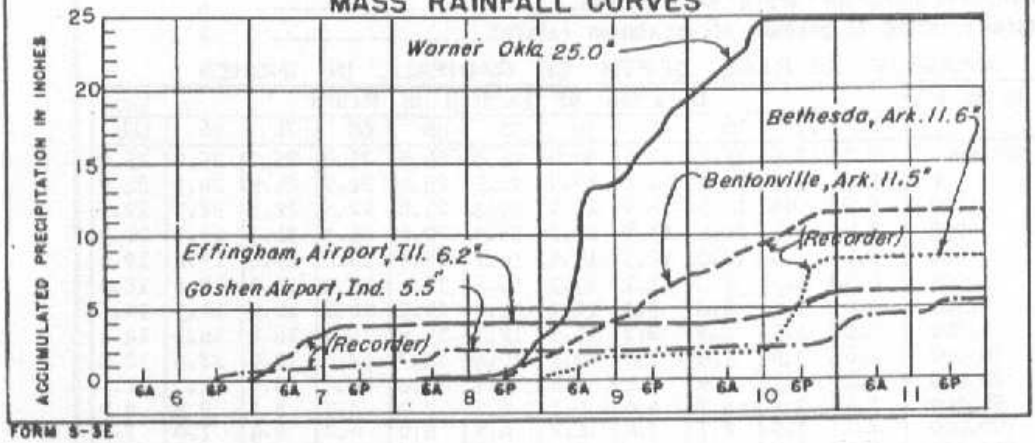
STORM STUDIES – ISOHYETAL MAP

Storm of 6-12 May 1943 Assignment SW 2-20

Study Prepared by: Tulsa, Okla. District

Southwestern Division

MASS RAINFALL CURVES



FORM 5-SE