



National Weather Service

Storm Data and Unusual Weather Phenomena



August 1998

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Number of Persons Injured	Estimated Damage Property	Estimated Damage Crops	Character of Storm
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WISCONSIN, Southeast

Columbia County

**Arlington to
Lodi**

04	0700CST 1200CST				0	0	20K		Flash Flood
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A series of thunderstorms, slowly moving northeast at 10 mph, trained through southern Columbia Co. and dumped 5 to 7 inches of rain between 0500CST and 1000CST. The resultant flash flooding led to shoulder gravel washouts on several roads, basement flooding (especially in Lodi), storm sewer backups, quick flooding of area rivers and streams, and some damage to a city park

The large-scale atmospheric setup for this flash flood consisted of a cutoff upper level low pressure over the Northern Plains and the associated surface low over Iowa. From the surface low pressure a frontal boundary extended northeast through Wisconsin. This combination pulled deep tropical moisture (surface dewpoints in the 70s) into Wisconsin. The frontal boundary served as a focus for thunderstorm development. Through August 6th, the upper level low pressure meandered southeast into Iowa while the surface low pressure moved to the Wisconsin-Illinois border, along a southwest-northeast orientated surface trough of low pressure.

Rock County

Beloit

05	0200CST 0800CST				0	0			Urban/Sml Stream Fld
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A series of thunderstorms moving slowly northeast at 10 mph trained over the Beloit area during the early morning hours. Minor urban flooding of streets to a depth of 6 inches to around 1 foot and some minor basement flooding were the main reports. An estimated 3 to 4 inches of rain fell from about 0100CST to 0800CST, but north of Beloit, 5.6 inches of rain fell at the Rock County Airport. The resultant airport runway flooding was the 1st occurrence on record!

Waukesha County

**Big Bend to
2S Big Bend**

05	0700CST 1000CST				0	0	40K		Flash Flood
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A series of thunderstorms, slowly moving northeast at 10 mph, trained through the Big Bend area of southeast Waukesha Co., dumping 4 to 6 inches of rain between 0400CST and 0900CST in Big Bend. A portion of Highway 164 was washed away by the flood waters, while a couple other roads had shoulder gravel washouts. A woman was rescued from her stalled car in 4 foot deep waters. Likewise, an elderly man was rescued from his stalled car. Just south of the village of Big Bend, a drainage ditch and feeder creek into the Fox River flooded and washed away a pedestrian bridge at the Fox River Inn on Highway 164. There was also significant soil erosion at that location. The synoptic reasons for this flooding can be found in the August 4th entry for flash flooding in Columbia Co.

Racine County

**Waterford to
4 N Waterford**

05	0700CST 1100CST				0	0	200K		Flash Flood
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A series of thunderstorms, slowly moving northeast at 10 mph, trained through western Racine Co., dumping 4 to 6 inches of rain between 0400CST and 0835CST in Waterford. Water levels in some farm fields reached an unbelievable 5 to 6 feet. Highway 164 north of Waterford was closed due to "rivers" of water 1 to 3 feet deep surging across the road surface. Shoulder gravel washouts were noted on Highway 164 and several other rural roads. A total of 10 homes were damaged. One home in Waterford sustained severe damage when its basement wall collapsed due to water pressure. A couple retaining walls in a Waterford subdivision were pushed over by the flood waters. The synoptic reasons for this flooding can be found in the August 4th entry for flash flooding in Columbia Co.



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WISCONSIN, Southeast

Rock County

Janesville

05	0750CST 1030CST				0	0	550K		Flash Flood
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A series of thunderstorms, slowly moving northeast at 10 mph, trained through Rock Co., dumping 3 to 4 inches of rain within a couple hours. The resultant flash flood left damage to about 50 homes in Janesville, washed out gravel road shoulders, and stalled or floated many vehicles. Water levels on many roads reached a depth of 1 to 3 feet, and forced the closure of the I-94 exit ramp at Highway 14. Some homes had basement wall damage, while many streets were closed until water levels receded. The synoptic reasons for this flooding can be found in the August 4th entry for flash flooding in Columbia Co.

Walworth County

Whitewater

05	0900CST 1300CST				0	0	100K		Flash Flood
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A series of thunderstorms, slowly moving northeast at 10 mph, trained through the Whitewater area... dumping 4 to 8 inches of rain between 0630CST and 1100CST. The resultant flash flooding closed some city roads due to water levels of 1 to 3 feet. Several stalled cars were reported. Water poured into the lower level of two UW-Whitewater buildings. In one of the buildings, water depths reach 4 feet, resulting in damage to the A/C system and electrical system. The loss of power resulted in the loss of a police radio frequency, since the radio equipment is housed in this building. Two homes suffered contents damage, while 1 business reported substantial damage. On the south side of the city, surging waters in a drainage ditch eroded the southwest embankment of the intersection of Highways 59 and 89. The synoptic reasons for this flooding can be found in the August 4th entry for flash flooding in Columbia Co.

Milwaukee County

Milwaukee

05	1000CST 1300CST				0	0	20K		Urban/Sml Stream Fld
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A series of thunderstorms, slowly moving northeast at 10 mph, trained through the Milwaukee area... dumping 2 to 4 inches of rain between 0900CST and 1300CST. The resultant urban flooding closed some roads, notably College Ave. from 27th to 31st street. Water depths on some city streets reached 1 to 2 feet. The Public Safety Building in downtown Milwaukee had a flooded basement. A tunnel at Mitchell International Airport had water levels of 4 feet, and the terminal also had some minor flooding in a baggage room. Water covered the passing lane on I-94 near the KK River. The synoptic reasons for this flooding can be found in the August 4th entry for flash flooding in Columbia Co.

Green County

Juda

05	1500CST				0	0			Funnel Cloud
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Rock County

Janesville to Milton

05	1515CST 1800CST				0	1	1.5M	150K	Flash Flood
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A series of thunderstorms, slowly moving northeast at 10 mph, trained through the Janesville to Milton area. This round of an additional 1 to 4 inches brought the day's total to 6 to 10 inches based on WSR-88D Doppler radars. The resultant flash flooding damaged the basement contents in about 70 homes, washed out some gravel shoulders on roads, and peeled back the pavement on a couple roads. Water levels on some area streets reached 3 to 4 feet. A 13-year old boy was injured in Janesville's Palmer Park after being swept into a culvert. He was under water for about 9 minutes. One Janesville home was destroyed when its basement wall collapsed. The surging waters busted out windows in several other homes. Another Janesville home was destroyed when one sidewall crumbled from the force of waist-high water. The Janesville Elks Club's parking lot sustained pavement damage. Nearby farm fields had water depths of 2 to 5 feet in low spots, with resultant damage to the corn crop. The synoptic reasons for this flooding can be found in the August 4th entry for flash flooding in Columbia Co.



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WISCONSIN, Southeast

Walworth County

1 W Williams Bay	05	1840CST 1841CST			0	0			Funnel Cloud
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Rock County

Clinton to 4 E Clinton	05	1945CST 2200CST			0	2	250K		Flash Flood
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A series of thunderstorms, slowly moving northeast at 10 mph, trained through the Clinton area, dumping an additional 4 to almost 6 inches. The day's rainfall total reached 8 inches based on WSR-88D Doppler radars. The resultant flash flooding washed out two bridges on roads north and northeast of Clinton. Two miles north of Clinton, at about 2010CST, a 12 foot long bridge on Highway 140 over Turtle Creek was washed away by surging waters. A few minutes later, with the bridge missing and visibilities poor, a vehicle was driven into Turtle Creek. Its two occupants were rescued by the local fire department. At 1020 pm, a couple miles east and upstream on Turtle Creek, a bridge on the Bradford-Clinton Townline Road was washed out by the flood waters. A vehicle was traveling on this bridge when it collapsed. The car and its two occupants were swept downstream about 100 yards. The injured occupants, after hanging on to tree branches for 1 hour, were rescued by the local fire department. In Clinton, several homes and businesses sustained flooding damage to their contents. East of Clinton on County X, several cars and trucks were swept off the road by the flood waters.

The village of Clinton registered 5.79 inches of rain between 1900CST and 2200CST. Turtle Creek in Clinton was above flood stage from 1115am on August 5th to 7pm on the 6th. The synoptic reasons for this flooding can be found in the August 4th entry for flash flooding in Columbia Co.

Walworth County

Delavan	05	2000CST 2300CST			0	0			Urban/Sml Stream Fld
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A series of thunderstorms, slowly moving northeast at 10 mph, trained through the Delavan area, dumping 2 to 4 inches of rain. The resultant urban flooding generated water depths of 1 to 2.5 feet on some city streets. Some roads were closed, and several vehicles stalled. Just north of Delavan, Turtle Creek, which runs into Lake Comus, was reported to be 2 feet over flood stage. The synoptic reasons for this flooding can be found in the August 4th entry for flash flooding in Columbia Co.

Walworth County

6 SE Whitewater to Tibbet	05	2030CST 2300CST			0	0	30K		Flash Flood
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A series of thunderstorms, slowly moving northeast at 10 mph, trained through the area southeast of Whitewater to northwest of Elkhorn, dumping an additional 1 to 3 inches of rain on top of an earlier 3 to 5 inches. The resultant flash flooding waters washed out gravel shoulders on several roads, and stalled several vehicles. Water levels in some of the low spots on roads reached 2 to 4 feet. Northeast of Tibbets, near lake Wandawega, a women was rescued from her vehicle by the local fire department. Twenty homes suffered contents damage in basement flooding. The synoptic reasons for this flooding can be found in the August 4th entry for flash flooding in Columbia Co.

Sheboygan County

Sheboygan	06	0540CST 1300CST			0	0	40M	50K	Flash Flood
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A devastating, record flash flood hit the area from Sheboygan Falls to the city of Sheboygan during the early morning hours, with Sheboygan having the worst of the flooding. An incredible 10.75 inches of rain fell at the Sheboygan Press building, and unofficial reports indicate that around 12 inches may have fallen in parts of the city. The rain started about 0100CST, and continued until about 0800CST as a series of thunderstorms, moving slowly northeast at 10 mph, trained through the same areas. Rainfall amounts diminished going west through the county... 5 inches fell in Plymouth. A "state of emergency" was declared by the Governor

At least 3 bridges in Sheboygan were severely damaged and immediately closed to traffic. Several other roads had chunks of



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WISCONSIN, Southeast

pavement torn loose, or curbs washed away. The monetary damage to the road and bridge infrastructure amounted to almost 6 million dollars! About 400 residential homes sustained minor damage, about 500 suffered major damage, and 6 were destroyed. Consequently, over 500 of these structures were left uninhabitable due to collapsed basement walls, shifting of foundations, etc. One elderly man was trapped in his home, but was rescued at the last second as his entire home disintegrated. Six businesses sustained minor damage, and 4 suffered major damage. Several downtown buildings had walls crumble due to the force of flood waters. Some city hillsides also collapsed. One man lost two vehicles, a camper, and basement and 1st floor personal property to the raging water currents. The City School District suffered substantial damage (\$1.2 million), especially to North High School. The Red Cross set up shelter for those who needed it, but also lost some of its emergency supplies due to a flooded basement. Two large apartment complexes had to have most of their residents evacuated due to water depths of 4 to 7 feet in the 1st floor rooms! One woman was rescued while floating on a mattress in water only 1 foot from the ceiling. Only minor crop damage was reported.

Many area and city roads were closed, and in some spots the water depth reached 5 to 6 feet! County Highway EE south of State 28 washed out, while I-43 west of the city of Sheboygan was reduced to one lane travel both ways. State 23 was closed at I-43 for a couple hours. Area golf courses were hit hard with many soil/tree washouts reported.

Many creeks throughout the eastern part of the county were described as "raging currents." Fisherman Creek in the city of Sheboygan was responsible for 1 bridge washout. The city's infrastructure suffered about \$2.5 million in damage. The Sheboygan River in Sheboygan set a new record crest of 12.02 feet at 1700CST (6pm), or 4.02 feet above flood stage. It remained above flood stage at this location from 0745CST on August 6th through 1400CST on the 7th. The max discharge was 7820 cfs, or between a 25 and 50 year flood.

Some quotes from newspapers: "The Great Flood of 1998", "It Just Never Stopped", "And the Rains Came", "Sheboygan Submerged", "We Were so Scared We Didn't Know What to do", "The Deluge of 98", and "Sheboygan Under Siege". The synoptic reasons for this flooding can be found in the August 4th entry for flash flooding in Columbia Co. Eastern Washington and Ozaukee Co. were persistent atmospheric breeding areas for all the thunderstorms that affected Sheboygan Co.

Sheboygan County Sheboygan

06	0630CST		0	0	25K	Lightning
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Lighting struck a cemetery building, and ignited a fire that damaged the building.

Milwaukee County Wauwatosa to Brown Deer

06	1430CST		0	1	22.1M	Flash Flood
07	0100CST					

Waukesha County Brookfield to New Berlin

06	1430CST		2	1	17.3M	Flash Flood
07	0100CST					

M100U, M140U

A monumental flash flood event ravaged adjacent portions of Milwaukee and Waukesha counties during the afternoon and evening hours. For the northwest quarter of Milwaukee Co., and the northeast/ eastcentral parts of Waukesha Co., it was the second year in row (press headline - "deja vu all over again"). In Milwaukee Co., the damage wasn't as bad as that in June 1997, but for Waukesha Co. it was the worst flooding ever. Here are the details broken down by county:

1) Milwaukee County...

The flash flood was the result of 5 to almost 9 inches of rain, between 1330CST (230pm) and 2000CST (9pm), falling on top of 1 to 3 inches that fell the previous two days. Maximum storm rainfall was 8.90 inches in Milwaukee on north 78th Street. A location in northern Wauwatosa came in with 8.40 inches between 2 pm and 9pm, while at 76th and Silver Springs in northwest Milwaukee, 7.12 inches were measured.

The flash flooding quickly exhausted the local resources available in the city of Brown Deer, while the Red Cross opened shelters. One-hundred and twenty people in Milwaukee Co. became homeless due to home damage, while another 215 were evacuated. All together, 3517 residential structures sustained damage in the county: 3308 minor, 206 major damage, and 3 destroyed. Five businesses reported minor damage, and 18 major damage. Two private/utility structures had minor damage, and 7 had major damage. These three categories collectively had damage amounts of \$20.05 million. There was an additional \$2.092 million in damage to the public sector such as road systems, buildings, water control, etc. About 6500 residential and 50 business places lost power due to various outages.

One 13 year-old boy was injured as he was swept by flood waters into a culvert and submerged for 15 minutes. Many roads were flooded and closed with water levels reaching 3 to 5 feet. Boats were needed to rescue several people. Highway 45 was closed, while Timmerman Field had minor flooding. A retaining wall in northwest Milwaukee collapsed due to high water levels. The city of Wauwatosa has decided to purchase some of the homes in the Menomonie River flood plain, and the city of Brown Deer will purchase some homes in the South Branch Creek flood plain to mitigate future damage.



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WISCONSIN, Southeast

The Menomomie River in Wauwatosa crested at a record 18.3 feet on August 6th at 2026CST (826pm), about a foot higher than that observed a year ago. It was above flood stage from 1600CST (500pm) on the 6th to 840CST (940 am) on August 7th. The discharge at this location was 12800 cfs, or between a 50 and 100 year flood. Water levels were so high in Wauwatosa that an Amtrack train was halted with 350 passengers on board. Underwood Creek in Wauwatosa crested at a record 13.10 feet, or 2.10 feet above flood stage. It was above flood stage from 1655CST (555pm) on August 6th to 1930CST (830 pm) on the 6th.

The synoptic reasons for this flooding can be found in the August 4th entry for flash flooding in Columbia Co. Eastern Walworth and western Racine Co. were persistent atmospheric breeding areas for all the thunderstorms that moved northeast over Milwaukee Co. Interestingly, the atmosphere recovered it's flash-flood potential during the late morning hours (after the Sheboygan County flash flood early on August 6th) as a southwest- northeast orientated surface front sagged south from Washington and Ozaukee counties to Walworth and Racine Counties by early afternoon.

2) Waukesha County...

The worst flash flooding of the 1900's struck eastern Waukesha Co. , resulting in large monetary loses, and forcing some residents to decide to move out of flood plains. The worst flash flooding occurred from Brookfield through Elm Grove into New Berlin, and was the result of 6 to almost 12 inches of rain between 1230CST (130pm) and 2000CST (9pm), falling on top of 1 to 2 inches that fell in the previous two days. Maximum storm rainfall was 11.75 inches in Elm Grove at the intersection of North and Calhoun. There was an 11.50 inch report out of Brookfield, while the Brookfield High School registered 8.75 inches.

Tragically, 2 teenage boys, ages 10 and 14, died when swirling flood waters swept them into a drainage ditch at 1710CST (610pm) which flowed into Underwood Creek in Elm Grove at Watertown Plank and Sunnyslope Roads. Rescue workers had to put on scuba diving gear to locate one of the boys. Flood waters of 4 to 5 feet covered much of New Berlin, half of Brookfields roads were submerged, and water to a depth of 4 to 7 feet settled in over Elm Grove. In fact, The Mill Place Shopping Center in Elm Grove still had standing water on August 7th. Flooding was so bad at the I-94 and Moreland Rd. interchange that local officials closed that intersection. Rescue workers in boats had to pluck people out of their stalled vehicles in that area. Compounding the flooding problem was the accumulation of raw sewage which backed into many basements.

Overall, 2680 residential homes sustained minor flood damage, while 10 had major damage. Thirty businesses suffered minor damage, 20 had major damage, and 2 were destroyed. One utility building sustained minor damage. There was nearly a half-million dollars in damage in the public sector to road systems, buildings, etc.

Many roads suffered gravel washouts on the shoulders, while a portion of Blackwolf Run golf course washed away. Many streams and creeks had high water levels for days after the bulk of the flash flood. The Fox River in Pewaukee crested at 12.08 feet at 0100CST (2am) on August 8th, or 2.08 feet over flood stage, and would stay above flood stage through the 10th. The synoptic reasons for this flooding can be found in the August 4th entry for flash flooding in Columbia Co. Eastern Walworth and western Racine Co. were persistent atmospheric breeding areas for all the thunderstorms that affected eastern Waukesha Co.

Green County

1 N New Glarus	14	1739CST		0	0		Hail (1.75)
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Green County

2 E Albany	14	1800CST		0	0		Hail (1.00)
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A west-east line of thunderstorms dropped southeast across southcentral Wisconsin, and a couple cells on the west flank briefly pulsed to severe weather limits. Large hail were the only reports.

Jefferson County

2 W Watertown	21	1423CST		0	0		Funnel Cloud
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Dodge County

2 NE Theresa	22	1736CST		0	0	1K	Thunderstorm Wind (G59)
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Washington County

3 W Wayne	22	1751CST		0	0	1K	Thunderstorm Wind
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A short line of thunderstorms moved east through northern Washington Co. and briefly pulsed to above severe limits. Powerful downburst winds toppled several large trees in northeastern Dodge Co. (gust to 68 mph), and then moved into northwestern Washington Co.

Jefferson County

Jefferson	24	2107CST		0	0		Hail (2.00)
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WISCONSIN, Southeast

Waukesha County

2 E Dousman	24	2133CST			0	0			Hail (0.75)
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Rock County

Beloit	24	2232CST			0	0	3.5M		Lightning
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A cluster of thunderstorms moved east and briefly pulsed to severe weather limits, and dumped large hail over parts of southeastern Wisconsin. Another thunderstorm's lightning struck a 139 year-old historical church in Beloit. The resultant fire destroyed the structure, and it's most of the contents were a total loss.