Storm Data and Unusual Weather Phenomena - September 2011

Location	Date/Time	Deaths & Injuries	Property & Crop Dmg	Event Type and Details

IOWA, Southwest

FREMONT COUNTY --- 3.8 W HAMBURG [40.59, -95.72], 1.6 NNW BARTLETT [40.90, -95.79], 3.4 WNW BARTLETT [40.90, -95.84], 5.8 W PERCIVAL [40.75, -95.91], 4.2 WSW PAYNE [40.64, -95.82]

	09/01/11 00:00 CST	3M	Flood (due to Heavy Rain)
	09/28/11 19:30 CST	0	Source: Official NWS Observations

Flooding along the Missouri River gradually improved over the area during September as releases from Gavins Point Dam were reduced. The river at Nebraska City, which reached a record crest of a little over 28 feet by the end of the June, had fallen to around 20.5 feet by the first of September and finally below its 18 foot flood stage during the evening of Sept. 28th. However, extensive flooding of farm fields, roads and highways that had occurred over the summer as levees near Hamburg and Percival failed persisted into September. The flooding caused the closure of 24 miles of Interstate 29 and Highway 2 into Nebraska City as well as other local roads and highways. After the flood waters receded, it was learned that Highway 2 near I29 had several areas of extensive damage, included a sink hole of 15 feet deep. Bridge approaches along I29 were damaged just north of the Missouri border. These roads remained closed in September.

HARRISON COUNTY --- 6.5 NW RIVER SIOUX [41.86, -96.15], 4.8 SW RIVER SIOUX [41.75, -96.12], 6.3 W MODALE [41.62, -96.14], 8.4 S MODALE [41.50, -96.04], 4.3 WSW MISSOURI VLY ARPT [41.51, -95.96], 2.5 SE LITTLE SIOUX [41.77, -96.00], 4.0 N RIVER SIOUX [41.86, -96.06]

	09/01/11 00:00 CST	5K	Flood (due to Heavy Rain)
	09/18/11 17:30 CST	0	Source: Official NWS Observations

Flooding along the Missouri River gradually improved and then basically ended over Harrison county during September as decreased releases from Gavins Point Dam allowed the river near Blair to fall below its 26.5 foot flood stage by the 18th. However, county roads, highways and parts of Interstate 29 sustained damage from flood waters as did some homes and several parks and recreation areas near the river. Parts of Interstate 29 remained closed during the month.

MILLS COUNTY --- 5.9 NNW FOLSOM [41.18, -95.86], 4.6 WSW FOLSOM [41.08, -95.91], 8.1 W TABOR [40.89, -95.82], 6.4 W TABOR [40.91, -95.79], 5.3 N FOLSOM [41.18, -95.83]

	09/01/11 00:00 CST	5K	Flood (due to Heavy Rain)
	09/27/11 03:00 CST	0	Source: Official NWS Observations

Flooding along the Missouri River, which had gradually worsened over Mills county during June and July began improving during August into September as record releases from Gavins Point Dam were reduced during August. At Plattsmouth the river reached a crest of a little over 36 feet by the end of June, flood stage is 26 feet. The river level near Plattsmouth fell a little in July and a bit more in early to mid August and by the first of September the river had fallen to around 30 feet. The river near Plattsmouth finally fell below flood stage on Sept. 27th. The flooding affected farmland along the river along with roads and recreational areas.

POTTAWATTAMIE COUNTY --- 5.7 NW LOVELAND [41.55, -95.99], 2.2 NE CARTER LAKE [41.32, -95.84], 1.9 NW LAKE MANAWA [41.24, -95.88], 0.4 N ISLAND PARK [41.18, -95.82], 3.9 SSW COUNCIL BLUFFS ARPT [41.22, -95.96]

	09/01/11 00:00 CST	50K	Flood (due to Heavy Rain)
	09/11/11 18:00 CST	0	Source: Official NWS Observations

Flooding along the Missouri River, which had gradually worsened over western Pottawattamie county during June and July, improved during August and basically ended by Sept. 11 as the river level at Omaha fell below its 29 foot flood stage. However, at it's peak the river near Omaha climbed to nearly 36 feet toward the end of June and remained very high into mid August. This caused extensive damage to Interstates 29 and 680 along with other roads and farm land in that area. Other properties near the river sustained flood damage and persistently high ground water also caused damage much of the summer.

A record rain event in May in eastern Montana combined with high water from other storms in April and May, plus snow melt from a much above normal snow pack, to bring record high water to the Missouri River chain of reservoirs by late Spring. Then residual snow melt and additional rains caused record 13.8 million and 10.0 million acre feet of runoff above Sioux City during June and July respectively. All of this helped contribute and sustain record releases from the Missouri River Reservoirs from mid June into early August. Releases from Gavins Point Dam, which is the last in the chain, reached around 160,000 cfs by the middle of June and remained that high into early August before dropping to around 90,000 cfs by the end of that month. The releases were then held steady for several weeks in early September to help avoid sloughing of water-logged levees. So although flooding continued into September at many points along the river, it moderated greatly. At the floods peak in western Iowa 46 miles of Interstate 29 were closed due to flooding and around 250,000 acres of farmland were inundated. The Iowa Farm Bureau Federation estimated that the flood event caused total crop and economic losses of $207 million in southwest Iowa.

SHELBY COUNTY --- 0.7 S SHELBY [41.51, -95.45]

	09/02/11 20:32 CST	0	Thunderstorm Wind (EG 52 kt)
	09/02/11 20:32 CST	0	Source: Trained Spotter

A spotter estimated thunderstorm wind gusts reached around 60 mph near Shelby.

Location	Date/Time	Deaths & Injuries	Property & Crop Dmg	Event Type and Details
SHELBY COUNTY --- HARLAN [41.65, -95.33]				
	09/02/11 20:47 CST		0	Thunderstorm Wind (MG 72 kt)
	09/02/11 20:47 CST		0	Source: AWOS

The Awos near Harlan measured a thunderstorm wind gust of 83 mph.

Scattered thunderstorms developed along a cold front across eastern Nebraska and western Iowa during the late afternoon and early evening of Sept. 2nd. At least one storm produced very strong winds as it tracked across western Iowa.

NEBRASKA, East

CASS COUNTY --- 2.5 N PLATTSMOUTH [41.06, -95.90], 2.0 SE PLATTSMOUTH [41.00, -95.88], 3.7 E PLATTSMOUTH MUNI ARP [40.94, -95.85], 3.5 NE UNION [40.86, -95.86], 3.6 SE UNION [40.78, -95.85], 5.0 ESE UNION [40.80, -95.81], 5.7 ESE PLATTSMOUTH [40.99, -95.80], 5.1 NNE PLATTSMOUTH [41.09, -95.86]				
	09/01/11 00:00 CST		50K	Flood (due to Heavy Rain)
	09/27/11 12:00 CST		0	Source: Official NWS Observations

Flooding along the Missouri River in Cass county which had gradually worsened during June and remained in a major or moderate flood category until late August, finally started letting up from late August into September as record releases from Gavins Point Dam were greatly reduced after mid August . At Plattsmouth the Missouri River reached a crest a little over 36 feet by the end of June, flood stage is 26 feet, remained at very high levels in July and August before dropping to around 30 feet by the first of September. Stepped decreases in reservoir releases allowed the river to finally fall below flood stage at Plattsmouth late in September. At its worst, the high water flooded farmland along with a few roads and recreation areas, including a road to the Plattsmouth water treatment plant. Some businesses and homes were also flooded, and most of the 210 dwellings around Lake Waconda in the area were evacuated.

CEDAR COUNTY --- 1.5 WNW ATEN [42.81, -97.50], 6.9 NNW ATEN [42.90, -97.51], 5.1 NNW ST HELENA [42.88, -97.30], 3.5 ENE ST HELENA [42.84, -97.18], 1.7 SE ST HELENA [42.81, -97.22]				
	09/01/11 00:00 CST		1K	Flood (due to Heavy Rain)
	09/18/11 12:00 CST		0	Source: Official NWS Observations

Flooding along the Missouri River, which had gradually worsened over the area during June and July, started improving in August and basically ended by mid September. The flooding was caused by record releases out of Gavins Point Dam which reached around 160,000 cfs by the end of June. These releases were cut way back in late August and even more by mid September due to decreased inflows into the river system . A few seasonal or permanent homes were threatened by the flood waters, but in general the flooding was confined to low areas and farmland along the river.

DOUGLAS COUNTY --- 5.4 N (3NO)NORTH OMAHA ARP [41.45, -96.00], 1.3 WNW EAST OMAHA [41.38, -95.97], 0.6 ESE NORTH OMAHA [41.33, -95.96], 2.2 SE ALBRIGHT [41.20, -95.94], 3.4 SE SOUTH OMAHA [41.20, -95.90], 2.3 E (OMA)EPPLEY FLD OMAH [41.30, -95.86], 7.2 NNE EAST OMAHA [41.47, -95.91]				
	09/01/11 00:00 CST		1M	Flood (due to Heavy Rain)
	09/12/11 12:00 CST		0	Source: Official NWS Observations

Flooding along the Missouri River in Douglas county, which had gradually worsened during June and July, started moderating in late August as releases from Gavins Point Dam were reduced. The river finally dropped below flood stage around Sept. 12th, although releases were slowed for several weeks in mid September to keep levees from sloughing off from too fast of a water drop . So although river levels had dropped below flood stage at Omaha by mid month, they were still high enough so that some minor overflows continued for much of September across a few of the normally flooded areas near the river. Earlier in the summer the river at Omaha had crested around 36 feet and had closed several parks, boating accesses, and recreational areas. Low areas around downtown on the river side of the federal levee were also flooded. By the end of August Omaha's tab for the flood fight had totaled $10 million, this was in addition to levee damage and money Eppley spent for flood control.

KNOX COUNTY --- 20.4 WNW VERDEL [42.98, -98.54], 1.7 S VERDEL [42.80, -98.20], 5.7 ESE NIOBRARA [42.73, -97.92], 8.1 NE LINDY [42.81, -97.61], 6.6 N CROFTON [42.82, -97.46], 11.1 N CROFTON [42.89, -97.50]				
	09/01/11 00:00 CST		5K	Flood (due to Heavy Rain)
	09/21/11 00:00 CST		0	Source: Official NWS Observations

Flooding along the Missouri River, which worsened over the area during June and July, persisted into August before moderating late in that month and in September. Record releases due to heavy rain and mountain snow melt above Ft. Randal Dam brought the widespread flooding along the river. In Knox county at its height the flooding closed Highway 12 between Verdel and Niobrara and the highway east of Niobrara and also closed Highway 14/37 north of Niobrara. However, the highways had reopened by early September. Earlier the flooding had forced the evacuation of 50 to 60 residences including the Lazy River Acres area between Niobrara and Verdel .

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Location	Date/Time	Deaths & Injuries	Property & Crop Dmg	Event Type and Details

NEMAHA COUNTY --- 3.0 NNW PERU [40.52, -95.75], 1.0 NNE NEMAHA [40.34, -95.66], 2.6 SSE NEMAHA [40.29, -95.66], 9.2 ESE NEMAHA [40.29, -95.50], 5.2 NNE PERU [40.55, -95.68]

09/01/11 00:00 CST		50K	Flood (due to Heavy Rain)
09/30/11 23:59 CST		0	Source: Official NWS Observations

Flooding along the Missouri River gradually worsened over Nemaha county during June as record releases from Gavins Point Dam and periodic heavy rains brought widespread flooding along the river. The river at Brownville started June around 39 feet, flood stage is 33 feet. The river gradually climbed to a record crest around 45 feet by the end of that month before falling as downstream levees were breached and widened by flooding. Moderate flooding persisted through July and into late August before the river fell even more due to decreased releases from upstream reservoirs . However, minor flooding persisted through September and into early October. At the peak of the flooding Highway 136 in Missouri, and the access road to a nuclear power plant were under water along with recreation areas and farmland along the river. The flooding of Highway 136 prompted the closure of the Brownville, Nebraska bridge over the Missouri River. Over 8,000 acres were covered in flood waters during the peak of the flooding in early summer.

OTOE COUNTY --- 8.1 N NEBRASKA CITY ARPT [40.79, -95.88], 3.7 NNE ELBERON [40.72, -95.93], 7.4 ESE PAUL [40.52, -95.76], 10.0 ESE PAUL [40.53, -95.69], 9.1 NNE NEBRASKA CITY ARPT [40.80, -95.82]

09/01/11 00:00 CST		50K	Flood (due to Heavy Rain)
09/28/11 02:00 CST		0	Source: Official NWS Observations

Flooding along the Missouri River gradually worsened during June and early July as record releases from Gavins Point Dam brought widespread flooding along the river. The river at Nebraska City, which climbed above its 18 foot flood stage in mid April, eventually reached a record crest of around 28 feet by the end of June before falling several feet in July as downstream levees were breached and widened. River values steadily dropped during September as upstream releases were lowered substantially and by the end of the month the river had fallen below flood stage at Nebraska City. During the height of the flooding in Otoe county, farmland, roads and recreation areas near the river flooded as did some cabins and a grain elevator near Nebraska City. Flood waters crossed Highway 2 in Fremont county Iowa prompting its closure on both sides of the river. Highway 2 remained closed into late October due to damage that occurred earlier in the summer even though river levels fell enough so that they no longer covered the road.

RICHARDSON COUNTY --- 2.3 N BARADA [40.25, -95.58], 1.4 WSW RULO [40.04, -95.45], 5.9 SE RULO [40.00, -95.34], 8.8 ESE RULO [40.01, -95.27], 7.0 ENE BARADA [40.26, -95.46]

09/01/11 00:00 CST		50K	Flood (due to Heavy Rain)
09/30/11 23:59 CST		0	Source: Official NWS Observations

Flooding along the Missouri River gradually worsened during June as record releases from Gavins Point Dam brought widespread flooding along the river. The river at Rulo rose to a record crest around 27 feet by the end of the June before falling slightly as levees were breached and widened by the flood waters. Flood stage is 17 feet. Although river levels steadily fell after mid August as upstream reservoirs reduced releases , moderate flooding persisted into early September. As releases decreased even further during September, river levels fell even more and at Rulo they were just a foot or so above flood stage by the end of September. At the height of the flooding, farmland along the river was flooded, along with roads, cabins, recreation areas and a few businesses. Highway 159 in Holt county Missouri flooded by the middle of the June prompting the closure of the Rulo, Nebraska bridge over the Missouri River for the summer.

SARPY COUNTY --- 1.5 N AVERY [41.19, -95.94], 0.5 NE BELLEVUE [41.13, -95.89], 1.5 SW ST COLUMBANS [41.06, -95.90], 1.9 SSE ST COLUMBANS [41.05, -95.87], 2.4 ENE BELLEVUE [41.13, -95.86], 5.5 ENE AVERY [41.21, -95.84]

09/01/11 00:00 CST		0.25M	Flood (due to Heavy Rain)
09/12/11 12:00 CST		0	Source: Official NWS Observations

Flooding along the Missouri River in Sarpy county gradually worsened during June and moderate flooding persisted into late August before releases from Gavins Point Dam began dropping. Initially the high releases and flooding was due to snow melt and heavy rain, but persistent heavy rain events above Sioux City as the summer wore on kept the reservoirs full and releases high. The river near Omaha climbed to around its 29 foot flood stage late in May and rose steadily through June reaching around 36 feet toward the end of the month. The river fell slightly during the first week of July but continued around 35 feet through much July before falling to around 34 feet over the first half of August. By the first of September the river near Omaha had fallen to around 31 feet as decreased releases from Gavins Point allowed the river to fall into the minor flood category. The river finally dropped below flood stage around Sept. 12th, although releases were slowed for several weeks in mid September to keep levees from sloughing off from too fast of a water drop . So although river levels had dropped below flood stage at Omaha by mid month, they were still high enough so that some minor overflows continued for much of September across a few of the normally flooded areas near the river. Earlier in the summer flooding in Sarpy county spread into at least one park causing its closure and boating and other recreational areas were also closed because of flooding. During the height of the flooding a section of the rail track that Amtrak used had to be closed to allow for its use as a levee .

WASHINGTON COUNTY --- 7.2 NNE BLAIR ARPT [41.68, -96.14], 1.9 E BLAIR [41.55, -96.11], 1.9 SE FT CALHOUN BIL LO AR [41.45, -96.00], 5.0 E FT CALHOUN BIL LO AR [41.48, -95.92], 8.0 NNE BLAIR ARPT [41.68, -96.09]

09/01/11 01:00 CST		0.10M	Flood (due to Heavy Rain)
09/13/11 09:00 CST		0	Source: Official NWS Observations

Storm Data and Unusual Weather Phenomena - September 2011

Location	Date/Time	Deaths & Injuries	Property & Crop Dmg	Event Type and Details

Flooding along the Missouri River which worsened across Washington county in June and July started improving in late August and the river near Blair finally dropped below its 26.5 foot flood stage in the morning of Sept. 13th. The river near Blair reached a crest of a little over 32 feet during the last week or so of June. In Washington county the flooding especially hit the Fort Calhoun area hard where at least 60 homes or cabins were flooded or cutoff by flood waters. At least 200 residences in the county were evacuated leaving at least 500 people displaced. This prompted the city to open the high school up for flood victims. Blair spent $500,000 to build up a levee surrounding its water treatment plant which held through June. The Ft. Calhoun Nuclear power plant was in refueling shut-down when the flooding started in April and because of the high waters remained shut-down through the summer as flood waters surrounded the plant prompting emergency sand bagging. In addition, recreation areas and roads along the river were flooded.

A record rain event in May in eastern Montana combined with high water from other storms in April and May, plus snow melt from a much above normal snow pack, to bring record high water to the Missouri River chain of reservoirs by late Spring. Then residual snow melt and additional rains caused record 13.8 million and 10.0 million acre feet of runoff above Sioux City during June and July respectively. All of this helped contribute and sustain record releases from the Missouri River Reservoirs from mid June into early August. Releases from Gavins Point Dam, which is the last in the chain, reached around 160,000 cfs by the middle of June and remained that high into early August before dropping to around 90,000 cfs by the end of that month. The releases were then held steady for several weeks in early September to help avoid sloughing of water-logged levees. So although flooding continued into September at many points along the river, it moderated greatly. Flooding in Nebraska in 2011, most of it along the Missouri River, inundated around 284,000 acres and damaged 1,164 homes.