



**Weather/Climate Information (Jim Angel and Bob Scott)**

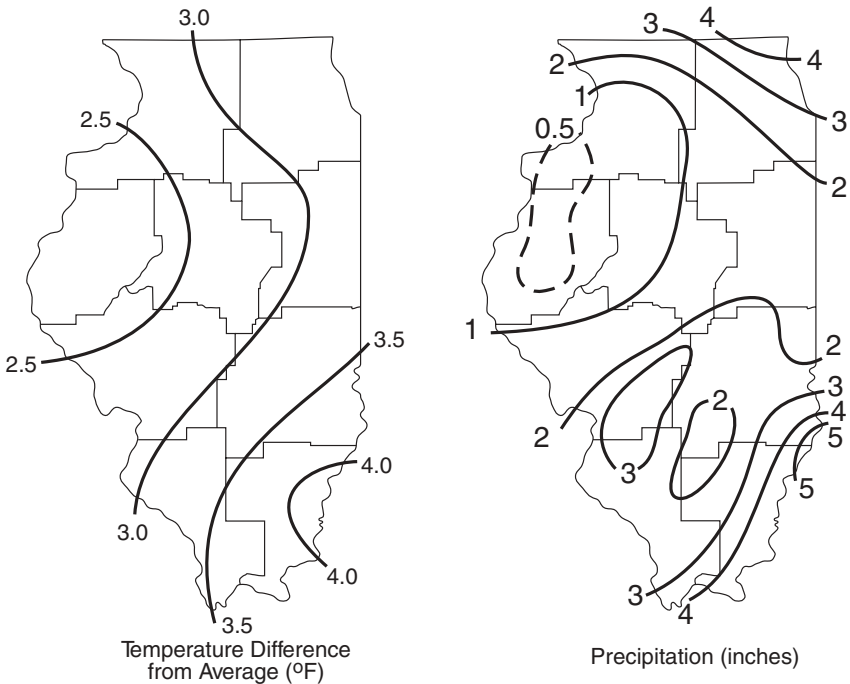
**Temperatures** across Illinois for September were warmer than average across the state (Figure 2 and Table 1). As a result, this was the 20th warmest September since 1895. The warmest reading for the month, 100°F, was reported on September 8 at Hutsonville. The coolest reading, 33°F, was observed at Mount Carroll, Harvard, and Monmouth, all on September 24. This was the 10th warmest July–September (3-month period), the 26th warmest April–September (6-month period), and the 11th warmest January–September (year-to-date) since 1895. Temperatures in Illinois for the last year have been well above average (54.4°F), ranking as the 4th warmest October–September on record, bested only by 1921 (55.7°F), 1932 (54.8°F), and 1954 (54.5°F).

**Precipitation** was below average statewide for September (Figure 2 and Table 1), the 21st driest September since 1895. However, there were strong differences within the state. The CRD precipitation totals varied from 26 percent of the average for the month (west) to 115 percent (southeast). Rockford reported the highest daily precipitation amount, 2.68 inches on September 20. The highest monthly total was 5.83 inches at Grand Chain Dam. This was the 40th driest July–September (3-month period), the 20th wettest April–September (6-month period), the 26th wettest January–September (year-to-date), and the 11th wettest October–September (12-month period) since 1895.

**Severe weather** was not widely reported across Illinois for September. Scattered thunderstorms passed through northern Illinois on September 18–19. A wind gust of 61 mph reported near Savanna downed buildings near Route 84. Downed power lines near Rockford were associated with this same weather system.

**Illinois Climate Network (ICN) Data.** Average daily wind speeds across Illinois for September (Figure 3) ranged from 3 mph at Dixon Springs and Rend Lake to about 7 mph at Monmouth. The highest wind gust for the month, 36 mph, occurred at Dixon Springs on September 19. The prevailing wind direction during September varied from the northeast over southeastern Illinois to the southwest in northeastern Illinois. Wind direction at Carbondale was from the south. Wind speeds in excess of 8 mph varied from 14 hours at Rend Lake to 234 hours at Monmouth. (September has 720 hours.) Average air temperatures ranged from the middle 60s north to the lower 70s south.

Solar radiation totals continued a seasonal decline, but reflected the larger rainfall totals in far southern Illinois (i.e., more clouds), ranging from 505 Mega-Joules per meter squared (MJ/m<sup>2</sup>) at Dixon Springs to just over 570 MJ/m<sup>2</sup> at Belleville. Potential evapotranspiration varied between 4.6 and 5 inches across the state. Soil temperatures at both the 4- and 8-inch levels ranged from the upper 60s across northern Illinois to the upper 70s in southeastern Illinois.



**Figure 2. Illinois temperature and precipitation during September 2002**

**Table 1. Illinois Precipitation (inches) and Temperature (°F) by Crop Reporting District**

<i>Crop Reporting District</i>	<i>Last Month</i>			<i>Last 3 Months</i>			<i>Last 6 Months</i>			<i>Last 12 months</i>		
	<i>Sep 02 Amount</i>	<i>% Avg</i>	<i>Temp Dev</i>	<i>Jul 02-Sep 02</i>	<i>% Avg</i>	<i>Temp Dev</i>	<i>Apr 02-Sep 02</i>	<i>% Avg</i>	<i>Temp Dev</i>	<i>Oct 01-Sep 02</i>	<i>% Avg</i>	<i>Temp Dev</i>
Northwest	1.70	51	2.9	9.94	87	1.9	25.01	107	0.8	36.92	102	2.7
Northeast	2.41	72	3.1	9.65	86	2.5	22.81	99	1.0	37.24	102	2.6
West	0.91	26	2.1	9.62	86	1.3	27.14	116	0.5	39.98	107	2.1
Central	1.07	34	2.5	9.83	92	1.9	25.10	112	0.7	40.58	109	2.2
East	1.80	61	3.0	12.89	119	2.4	26.27	117	0.9	45.45	121	2.1
West-southwest	2.22	73	2.6	9.31	95	2.1	28.95	133	1.1	46.94	124	2.1
East-southeast	2.98	97	3.4	7.45	71	2.8	26.90	118	1.7	49.83	121	2.2
Southwest	3.14	98	3.5	7.14	70	2.7	24.06	105	1.8	47.79	112	2.1
Southeast	3.49	115	4.1	6.72	67	3.3	23.95	103	2.3	53.35	120	2.6
<b>State Average</b>	<b>2.17</b>	<b>68</b>	<b>3.0</b>	<b>9.21</b>	<b>86</b>	<b>2.3</b>	<b>25.70</b>	<b>113</b>	<b>1.2</b>	<b>43.98</b>	<b>113</b>	<b>2.3</b>

**Note:** Data are provisional. Complete, quality controlled data are available about six months after a given month.

**Extended climate outlooks** issued by the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Climate Prediction Center for October call for equal chances of above, below, and normal temperatures and precipitation. The October–December outlook calls for a slight chance of above normal temperatures in northern Illinois, and equal chances of above, below, and normal precipitation statewide.

### Soil Moisture Information (Bob Scott)

Above average precipitation fell across parts of southern Illinois in September; however, most of Illinois received below average rainfall. Combined with the spotty, heavy-to-light rainfall totals that were typical in Illinois during summer 2002, soil moisture conditions in the state at the end of September varied greatly from north to south and with soil depth (Figure 4). Soils in the 0- to 6-inch layer were generally dry across the northwestern third of the state and wet in the far south. Above normal soil moisture was observed in the 6- to 20-inch layer near Dixon Springs and Monmouth, but dry conditions were prevalent in south-central Illinois within this layer. Soil moisture (Table 2) was above normal in the 20- to 40- and 40- to 72-inch layers in west-central, east-central, and far southeastern Illinois, below normal in northeastern Illinois, and very dry over parts of southern Illinois. Dixon Springs had maximum moisture amounts within all layers (125–175 percent of normal), while the area from Belleville to Olney was driest in the two deepest layers (10–50 percent of normal). Overall, soil moisture in Illinois at the end of September was below normal (Figure 1).

Compared to last month, soil moisture generally decreased across northern Illinois but increased in the south. Largest decreases in the 0- to 6-inch layer occurred from Freeport to Perry (40 percent), and largest increases (100–200 percent) were observed from Belleville to Dixon Springs. Sites in northern Illinois reported moisture decreases of 10–40 percent in the 6- to 20-inch layer. Southern Illinois moisture increases in the same layer were on a slightly smaller scale, except for 150 and 300 percent increases at Dixon Springs and Belleville, respectively. Changes in the 20- to 40-inch layer were generally negative and small (less than 15 percent), except for a 36 percent increase at Dixon Springs.

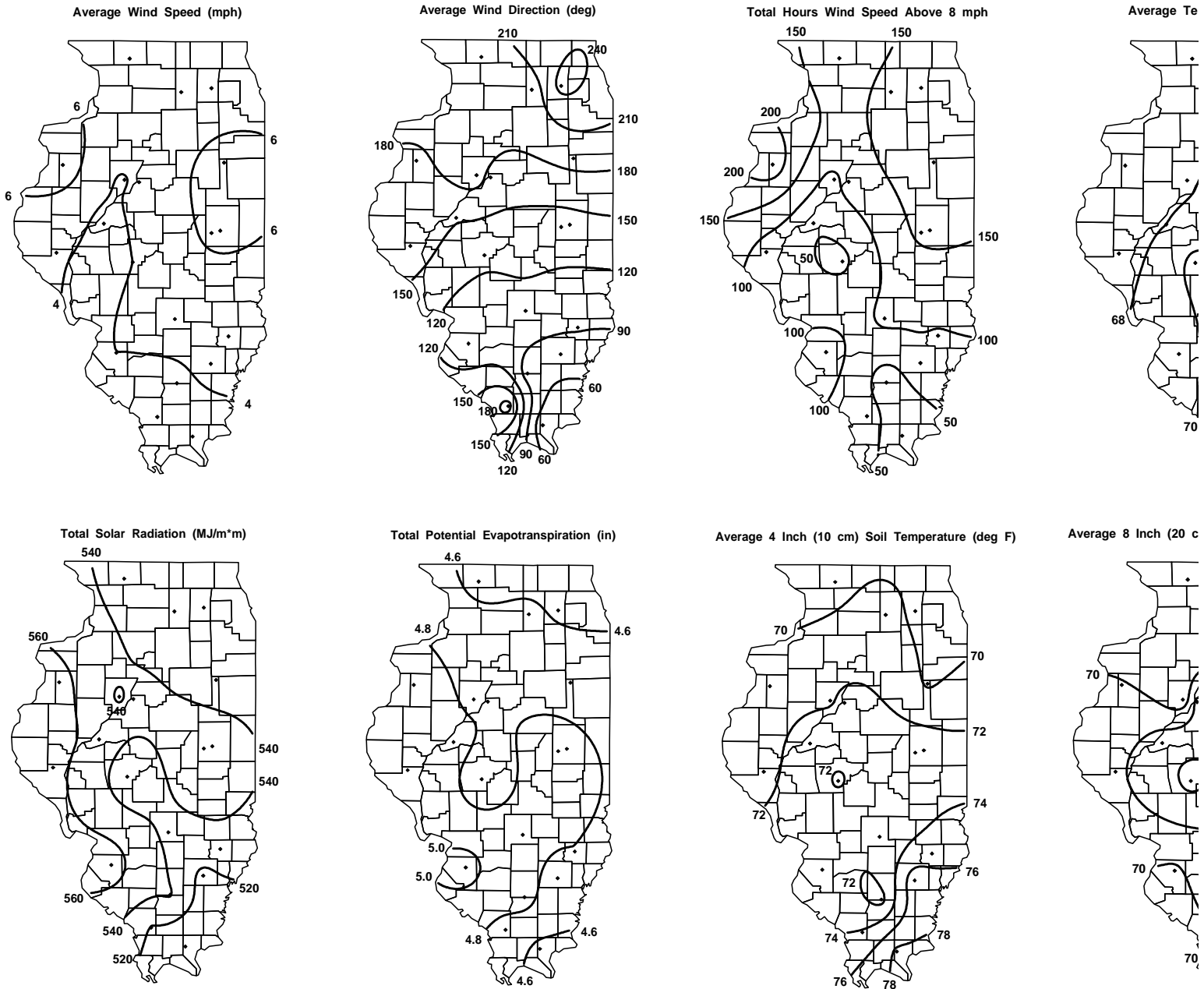


Figure 3. September monthly averages and totals as collected by the Illinois Climate Network

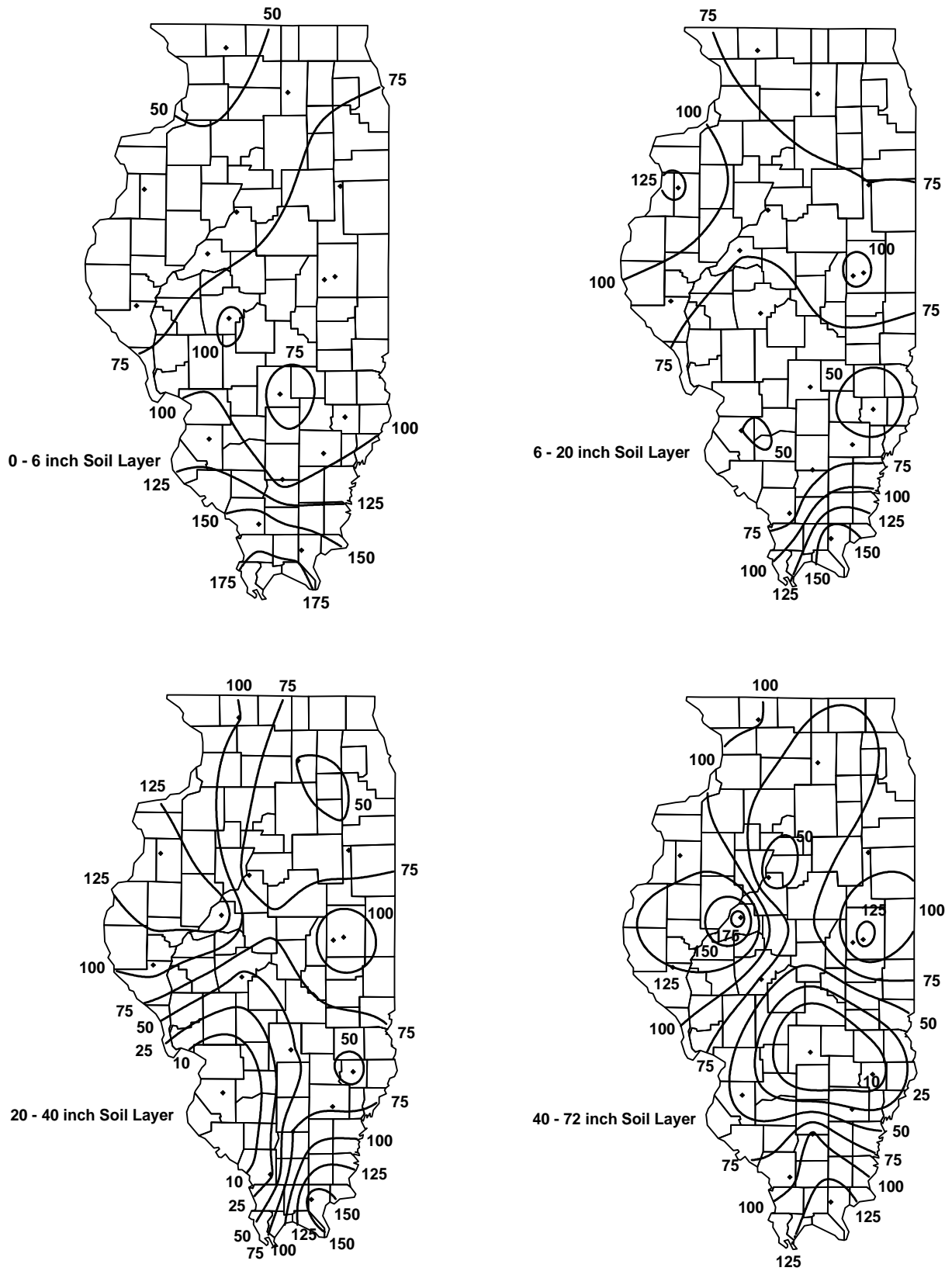


Figure 4. October 1 observed percent-of-normal soil moisture based on 1985-1995 mean

**Table 2. Soil Moisture in Various Layers on October 1, 2002**

<i>Location</i>	<i>Oct 1 0 - 6 (inches)</i>	<i>Change from Sep 1 (%)</i>	<i>Oct 1 6 - 20 (inches)</i>	<i>Change from Sep 1 (%)</i>	<i>Oct 1 20 - 40 (inches)</i>	<i>Change from Sep 1 (%)</i>
Freeport (NW)	1.0	-43	2.7	-39	6.2	-11
DeKalb (NE)	1.4	-15	3.3	-28	5.7	-4
Monmouth (W)	1.3	-20	4.0	-13	6.3	-3
East Peoria (C)	1.0	-44	3.8	-23	6.8	-13
Topeka (C)	0.6	-40	1.8	-32	2.8	-9
Stelle (E)	1.4	2	3.6	-23	5.0	-4
Champaign (E)	1.4	-16	4.4	-13	5.7	-7
Bondville (E)	1.6	-11	3.9	-12	7.1	-5
Pery (WSW)	1.1	-37	3.6	-28	6.9	-7
Springfield (WSW)	1.6	-7	4.1	-11	6.5	-2
Brownstown (ESE)	0.9	38	1.9	13	6.1	0
Olney (ESE)	1.2	38	3.3	2	6.3	-2
Belleville (SW)	1.3	112	1.3	299	4.7	-9
Carbondale (SW)	1.9	187	2.1	41	5.1	-10
Ina (SE)	1.5	47	4.3	15	7.3	-1
Fairfield (SE)	1.3	68	3.5	12	6.5	-3
Dixon Springs (SE)	2.4	217	5.4	153	7.7	36

### **Surface Water Information (Sally McConkey)**

**River and stream discharge and stage data** are obtained from gaging stations operated by the U.S. Geological Survey (USGS) or the U.S. Army Corps of Engineers (USACE). The USGS gaging station network is supported in part by the Illinois Department of Natural Resources Office of Water Resources and the Illinois State Water Survey, and USACE. Provisional discharge data are obtained from direct computer access to the USGS.

Table 3 lists selected streamgaging stations located on the Illinois, Mississippi, and Ohio Rivers, flood stage, and the provisional peak stage for the current month. The peak stage is determined from the daily morning reading posted by the National Weather Service and/or USACE. Stations on the Illinois River recorded peak stage below flood stage. The Mississippi River along the Illinois border likewise recorded peak stages below flood stage, and most stations recorded peaks on the first day of the month. The Ohio River at Cairo peaked well below flood stage.

Table 4 lists 26 streamgaging stations located throughout Illinois. Provisional monthly mean flows posted by the USGS are listed if available; otherwise, daily mean discharge data posted by the USGS were used to estimate the mean flow for the month. Long-term mean flows for each month are published by the USGS. The month's median flow for each station listed in Table 4 was determined by ranking the September mean flow for each year of record and selecting the middle value, 50 percent exceedence probability.

**Mean provisional flow** statewide was above the median this month (127 percent of the median) and below the mean (47 percent of the mean). Stations in northern and central Illinois recorded mean flows in the normal to above normal range. The Kankakee River at Momence was an exception for the third consecutive month with a mean flow much below normal. Stations in southeastern Illinois again recorded mean flows below normal this month. At the southern tip and in the southwestern part of the state, the Cache River at Forman, Shoal Creek near Breese, and the Big Muddy River at Plumfield recorded flows in the normal range.

**Water-Supply Lakes and Major Reservoirs.** Table 5 lists reservoirs in Illinois, their normal pool or target water surface elevation, and other data related to observed variations in water surface elevations. Reservoir levels are

**Table 3. Peak Stages for Major Rivers, September 2002**

<i>River</i>	<i>Station</i>	<i>River mile*</i>	<i>Flood stage (feet)*</i>	<i>Peak stage (feet)**</i>	<i>Date</i>
Illinois	Morris	263.1	13	5.2	27
	La Salle	224.7	20	11.3	24
	Peoria	164.6	18	12.3	22
	Havana	119.6	14	7.0	01
	Beardstown	88.6	14	10.1	04
	Hardin	21.5	25	19.8	01
Mississippi	Dubuque	579.9	17	10.8	15
	Keokuk	364.2	16	7.0	01
	Quincy	325.0	17	12.2	01
	Grafton	218.0	18	15.9	17
	St. Louis	180.0	30	10.0	01
	Chester	109.9	27	12.4	01
	Thebes	43.7	33	17.0	01
Ohio	Cairo	2.0	40	25.7	30

**Notes:**

\*River mile and flood stage from *River Stages in Illinois: Flood and Damage Data*, Illinois Department of Natural Resources, Office of Water Resources, July 1998.

\*\*Peak stage based on daily a.m. readings, not instantaneous peak.

reported in terms of their difference from normal pool (or target level). Reservoir levels are obtained from a network of cooperating reservoir operators who are contacted each month by Survey staff for the current water levels. The average of the month-end readings for the period of record is reported in terms of the difference from normal pool or target level in column 6. The number of years of record for each reservoir is given in column 7 (second to last) of Table 5. Most reservoirs listed in Table 5 serve as public water supplies, with the exceptions noted in the last column.

Compared to levels at the end of August at 39 reservoirs, the water surface elevation at the end of September had risen at 2 reservoirs and decreased at 31 reservoirs. The reported elevation was the same as last month at 6 reservoirs. For the 40 reservoirs reporting at the end of September, 3 reservoirs had water surface levels above the normal pool (or target operating level), 4 reservoirs were at normal pool, and 33 reservoirs were below normal pool. The water level at Kinkaid reservoir was lowered to accommodate spillway work. Seven reservoirs were 3 feet or more below normal/target pool.

*Major Reservoirs.* Water levels at Lake Shelbyville and Rend Lake declined slightly from last month, but both reservoirs were above target level. Carlyle Lake ended September at the target level.

**Great Lakes.** Current month mean and end-of-month values are provisional and are relative to International Great Lakes Datum 1985. The September mean level for Lake Michigan was 578.2 feet, compared to a mean level of 577.5 feet in 2001. The long-term average lake level for September is 579.2 feet, based on 1918–1998 data. Historically, the lowest mean level for Lake Michigan in September occurred in 1964 at 576.6 feet, and the highest level occurred in 1986 at 582.0 feet. The month-end level of Lake Michigan was 578.1 feet.

**Table 4. Provisional Mean Flows, September 2002**

Station	Drainage area (sq mi)	Years of record	2002 mean flow (cfs)	Long-term flows		Flow condition	Percent chance of exceedence	Days of data this month
				Mean*	Median			
Rock River at Rockton	6,363	66	2,575	2,870	2,685	normal	47	30
Rock River near Joslin	9,549	58	4,080	4,240	3,703	normal	38	30
Pecatonica River at Freeport	1,326	82	750	754	639	normal	40	30
Green River near Geneseo	1,003	63	161	344	161	normal	50	30
Edwards River near New Boston	445	63	64	128	47	normal	38	26
Kankakee River at Momence	2,294	84	468	984	745	much below normal	93	30
Iroquois River near Chebanse	2,091	77	151	563	121	normal	41	30
Fox River at Dayton	2,642	82	618	975	591	normal	49	30
Vermilion River at Pontiac	579	57	30.1	121	16	normal	31	30
Spoon River at Seville	1,636	84	173	615	198	normal	57	30
LaMoine River at Ripley	1,293	78	78.8	441	125	below normal	71	30
Bear Creek near Marceline	349	57	5.5	157	18	normal	68	30
Mackinaw River near Congerville	767	52	60	255	23	above normal	30	30
Salt Creek near Greenview	1,804	59	521	418	195	above normal	18	27
Sangamon River at Monticello	550	89	49.7	115	26	normal	38	30
South Fork Sangamon near Rochester	867	51	40.1	140	23	normal	39	30
Illinois River at Valley City	26,743	62	8,515	11,450	8,115	normal	44	29
Macoupin Creek near Kane	868	72	123	179	48	above normal	30	30
Vermilion River near Danville	1,290	57	180	253	104	normal	31	30
Kaskaskia River at Vandalia	1,940	31	408	580	310	normal	45	29
Shoal Creek near Breese	735	57	58.3	139	35	normal	44	30
Embarras River at Ste. Marie	1,516	87	42	381	115	below normal	85	30
Skillet Fork at Wayne City	464	81	1.14	77	20	below normal	88	30
Little Wabash below Clay City	1,131	86	15.5	215	63	below normal	81	30
Big Muddy at Plumfield	794	86	85.1	135	74	normal	47	30
Cache River at Forman	244	77	20.9	56	15	normal	43	30

**Notes:**

Much below normal flow = 90-100% chance of exceedence.

Below normal flow = 70-90% chance of exceedence.

Normal flow = 30-70% chance of exceedence.

Above normal flow = 10-30% chance of exceedence.

Much above normal flow = 0-10% chance of exceedence.

\*As reported in U.S. Geological Survey (USGS) Water Resources Data, Illinois, Water Year 1999.



## Groundwater Information (Ken Hlinka)

**Comparison to Average Levels.** Shallow groundwater levels in 14 observation wells that are remote from pumping centers were below average levels for September by 0.7 feet and ranged from 9.4 feet below to 2.4 feet above average (Table 6). The water level at one well, Cambridge (Henry County), was at a record low for September.

**Comparison to Previous Month.** Shallow groundwater levels were below those of August 2002. Levels averaged 0.9 feet lower than those of last month and ranged from 8.4 feet below to 5.8 feet above the August levels.

**Comparison to Same Month, Previous Year.** Shallow groundwater levels from the network were below levels of September 2001. Levels averaged 0.2 feet below and ranged from 5.9 feet below to 3.9 feet above levels last year.

**Table 6. Month-End Shallow Groundwater Level Data Sites, September 2002**

Number	Well name	County	Well depth (feet)	This month's reading (depth to water, feet)	Deviation from			
					15-year avg. level (feet)	Period of record avg. (feet)	Previous month (feet)	Previous year (feet)
1	Galena	JoDaviess	25.00	19.73	+1.45	+1.55	-1.33	+1.85
2	Mt. Morris	Ogle	55.00	N/A	N/A	N/A	N/A	N/A
3	Crystal Lake	McHenry	18.00	N/A	N/A	N/A	N/A	N/A
4	Cambridge	Henry	42.00	20.67	-8.75	-9.35	-8.35	-5.91
5	Fermi Lab	DuPage	17.00	8.36	-0.69	-0.75	-0.41	-1.04
6	Good Hope	McDonough	30.00	N/A	N/A	N/A	N/A	N/A
7	Snicarte	Mason	42.00	37.06	-0.18	-0.07	-0.35	+1.12
8	Coffman	Pike	28.00	14.31	-0.18	+0.12	-2.56	-1.04
9	Greenfield	Greene	20.70	15.86	-0.36	-0.64	-1.75	-1.02
10	Janesville	Cumberland	11.00	7.19	-0.89	-0.72	-0.58	+0.31
11	St. Peter	Fayette	15.00	6.29	-1.48	-1.58	-0.79	-1.02
12	SWS #2	St. Clair	80.00	14.31	N/A	+1.43	N/A	-0.14
13	Boyleston	Wayne	23.00	7.74	-0.12	+0.01	-1.06	+0.56
14	Sparta	Randolph	27.00	9.69	-0.64	+0.05	-0.52	-1.25
15	SE College	Saline	10.19	9.31	-1.24	-1.73	+0.31	+0.49
16	Dixon Springs	Pope	8.63	2.86	+4.09	+2.43	+5.76	+3.94
17	Bondville	Champaign	21.00	5.32	+0.05	+0.20	+0.06	+1.04
Averages					-0.69	-0.65	-0.89	-0.15

**Note:**  
N/A = Data not available.

## Addendum

### Long-Term Precipitation Networks (Nancy Westcott)

**Imperial Valley Precipitation.** September precipitation amounts (Figure 5a) were extremely light. Amounts were heaviest in the eastern portion of the network and lightest along the western boundary and in the northeastern corner of the network. Individual gauge totals ranged from 1.01 inches at site #23 to 0.13 inches at site #4. The 30-year (1971–2000) average precipitation amounts for September at Havana and Mason City are 3.21 and 3.00 inches, respectively. The September 2002 network average of 0.39 inches was about 13 percent of the 10-year (1992–2001) September network average of 3.03 inches.

**Cook County Precipitation.** September precipitation amounts (Figure 5b) were light. Precipitation values ranged from 2.93 inches at site #1 (Northbrook) to 1.20 inches at site #24 (Matteson). Precipitation was heaviest in the northern portion of the network and lightest in the south. The September 2002 network average of 1.88 inches was about 61 percent of the 12-year (1990–2001) September network average of 3.10 inches.

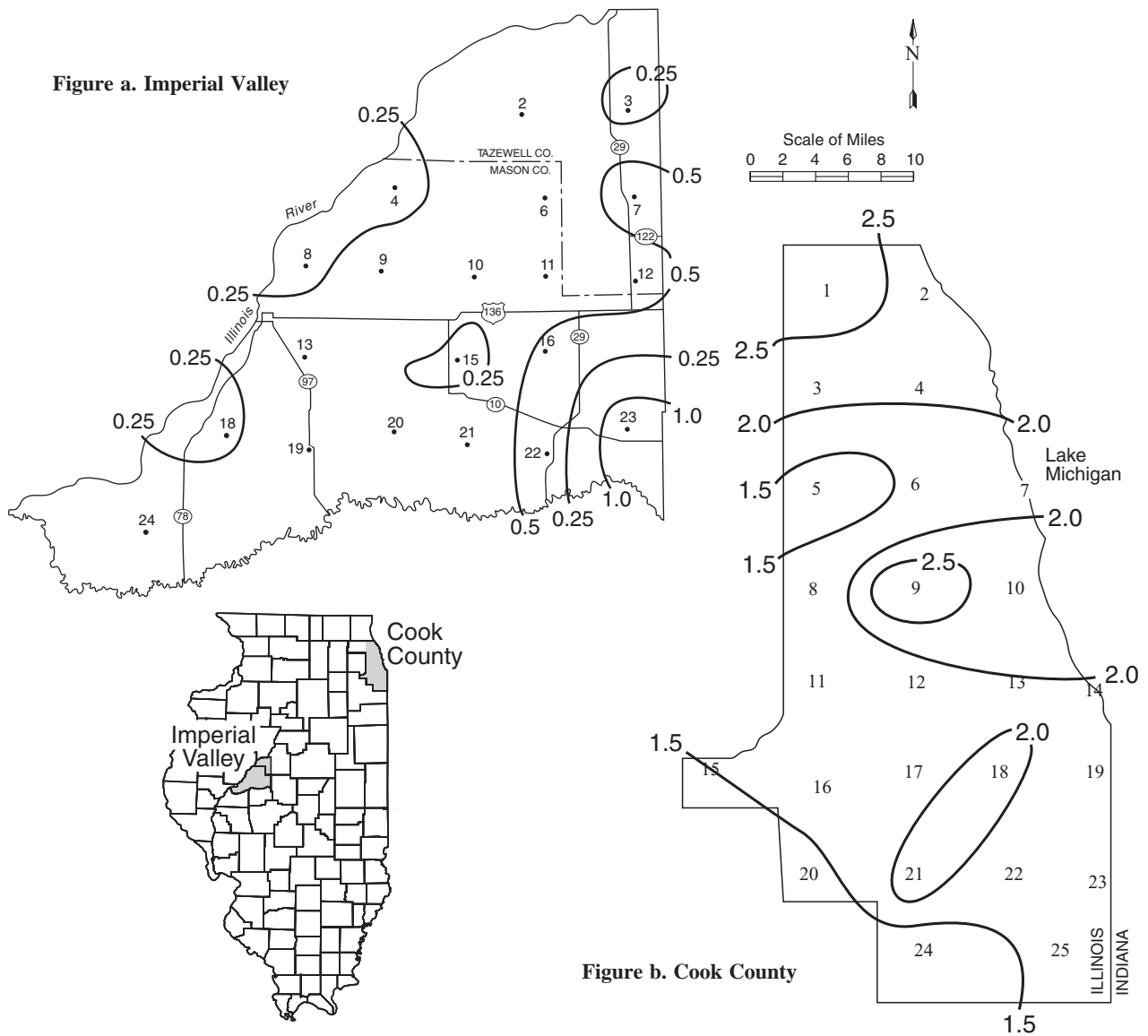


Figure 5. Long-term rain gauge network precipitation totals (inches) for September 2002

**Data sources for information in this publication include the following:**

- CPC - Climate Prediction Center, <http://www.cpc.ncep.noaa.gov/products/predictions/>
- ISWS - Illinois State Water Survey, <http://www.sws.uiuc.edu/>
- MCC - Midwestern Regional Climate Center, <http://mrcc.sws.uiuc.edu/>
- NCDC - National Climate Data Center, <http://www.ncdc.noaa.gov/>
- NWS - National Weather Service, <http://www.nws.noaa.gov/>
- USACE - U.S. Army Corp of Engineers, <http://water.mvr.usace.army.mil/>
- USGS - U.S. Geological Survey, <http://water.usgs.gov/>
- WARM - Water and Atmospheric Resources Monitoring Program, <http://www.sws.uiuc.edu/warm/>