



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

**Temperatures** within Illinois for October were much cooler than average across the state (Figure 2 and Table 1). As a result, this was the 12th coolest October since 1895, reversing a trend of above average temperatures that began in June. Temperatures changed dramatically during the month. The first 12 days averaged 4.6°F above average, while the last 19 days averaged 8.0°F below average. The warmest reading for the month, 93°F, was reported on October 3 at Hutsonville. The coolest reading, 21°F, was observed on October 20 at Mount Carroll. Conditions over the last year continued to be quite warm. This was the 20th warmest January–October (year-to-date) and the 3rd warmest November–October (12-month period) since 1895.

**Precipitation** was above average statewide for October (Figure 2 and Table 1), the 33rd wettest October since 1895. However, there were strong differences within the state, being relatively dry in the northeast and wet in the west. Mount Carroll reported the highest daily precipitation amount, 2.43 inches on October 2. The highest monthly total was 5.30 inches at Belleville. This was the 49th wettest August–October, the 29th wettest May–October, the 22nd wettest January–October (year-to-date), and the 25th wettest November–October (12-month period) since 1895.

**No severe weather** was reported in Illinois for October.

**Illinois Climate Network (ICN) Data.** Average daily wind speeds across Illinois for October (Figure 3) ranged from 3 mph at Dixon Springs to 9 mph at Monmouth and Stelle. The highest wind gust for the month occurred at Stelle, 44 mph on October 4. The prevailing wind direction during October was from the north over southeastern Illinois and from the west in western Illinois. Wind speeds in excess of 8 mph varied from 31 hours at Dixon Springs to 426 hours at Monmouth. (October has 744 hours.)

Average air temperatures ranged from the upper 40s north to the middle 50s south. Solar radiation totals continued a strong seasonal decline, ranging from 297 Mega-Joules per meter squared (MJ/m<sup>2</sup>) at Freeport to 366 MJ/m<sup>2</sup> at Belleville. Potential evapotranspiration varied between 2.2 and 2.6 inches across the state. Soil temperatures at both the 4- and 8-inch levels ranged from the middle 50s across northern Illinois to the middle 60s in southeastern Illinois.

**Extended climate outlooks** issued by the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Climate Prediction Center for November call for equal chances of above, below, and normal tempera-

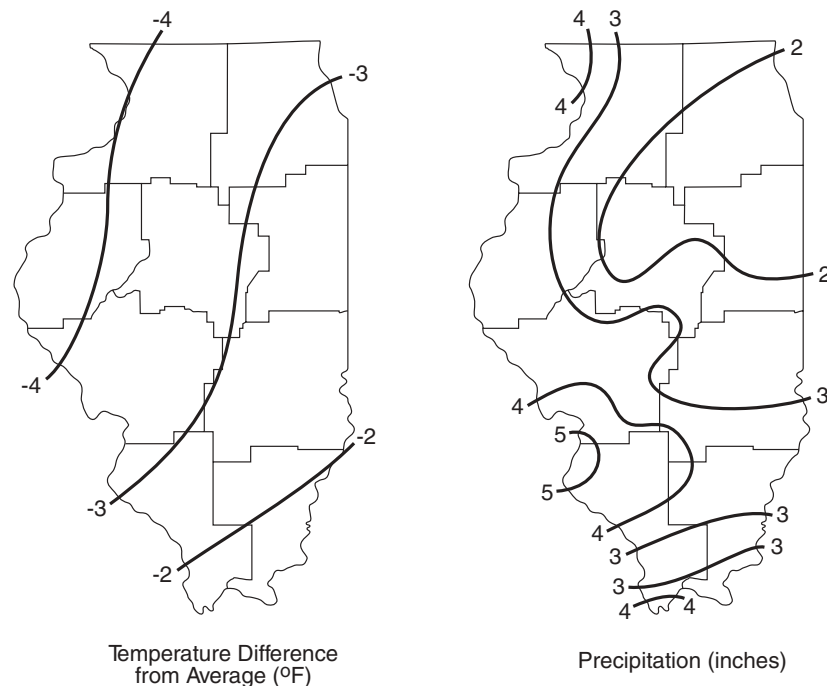


Figure 2. Illinois temperature and precipitation during October 2002

**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>Oct 02 Amount</i>	<i>% Avg</i>	<i>Temp Dev</i>	<i>Aug 02- Oct 02</i>	<i>% Avg</i>	<i>Temp Dev</i>	<i>May 02- Oct 02</i>	<i>% Avg</i>	<i>Temp Dev</i>	<i>Nov 01- Oct 02</i>	<i>% Avg</i>	<i>Temp Dev</i>
Northwest	3.45	120	-3.6	10.03	95	0.0	23.86	105	0.2	35.73	99	2.5
Northeast	2.32	84	-2.9	9.99	97	0.5	20.88	95	0.4	33.00	90	2.4
West	3.23	108	-4.5	9.41	93	-0.8	25.09	110	-0.3	38.38	102	1.9
Central	2.35	81	-3.4	8.73	90	0.0	22.30	102	0.0	36.83	99	2.0
East	2.30	80	-2.3	10.21	106	0.7	23.03	105	0.2	39.23	104	2.0
West-southwest	3.78	134	-3.5	10.71	118	0.1	26.80	129	0.2	45.02	119	1.8
East-southeast	3.66	121	-2.8	9.11	96	1.0	24.49	112	0.8	45.37	110	2.1
Southwest	4.83	159	-2.6	11.08	116	1.0	23.00	106	0.9	45.85	107	2.0
Southeast	4.47	150	-1.9	9.95	107	1.7	21.72	100	1.5	49.50	111	2.5
<b>State Average</b>	<b>3.35</b>	<b>115</b>	<b>-3.1</b>	<b>9.90</b>	<b>102</b>	<b>0.4</b>	<b>23.59</b>	<b>108</b>	<b>0.4</b>	<b>40.78</b>	<b>105</b>	<b>2.1</b>

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

tures and precipitation. November–January outlooks call for a slight chance of above normal temperatures statewide and a slight chance of below normal precipitation in southeastern Illinois.

### Soil Moisture Information (Bob Scott)

Soil moisture conditions in Illinois at the end of October varied greatly from north to south and with depth (Figure 4). In the 0- to 6-inch layer, soils were slightly below normal over northeastern Illinois (85 percent of normal) and well above normal in southwestern Illinois (175 percent of normal). The same pattern was evident in the 6- to 20-inch layer, except for drier soils in the northeast (50 percent of normal). A more complex soil moisture pattern was observed in the two deepest layers. In general, near normal soil moisture was measured in the 20- to 40- and 40- to 72-inch layers over west-central and east-central Illinois. However, some southern sites reported very dry soils in these layers, as low as 10 percent of normal. Overall, soil moisture in Illinois at the end of October was near normal (Figure 1).

Compared to last month, soil moisture increased greatly especially near the surface (Table 2). In the 0- to 6-inch layer, soils were considerably wetter across all but far southern Illinois. Largest increases (about 105 percent) occurred at Perry and Brownstown with no change at Carbondale and Dixon Springs. In the 6- to 20-inch layer, sites in northern and central Illinois reported virtually no change in moisture, but significant increases (roughly 10 – 55 percent) were observed in southern Illinois, and Belleville measured a substantial increase, nearly 285 percent. Moisture changes in the 20- to 40-inch layer were generally small, except for a 14 percent increase at Brownstown and a 23 percent decrease at Topeka.

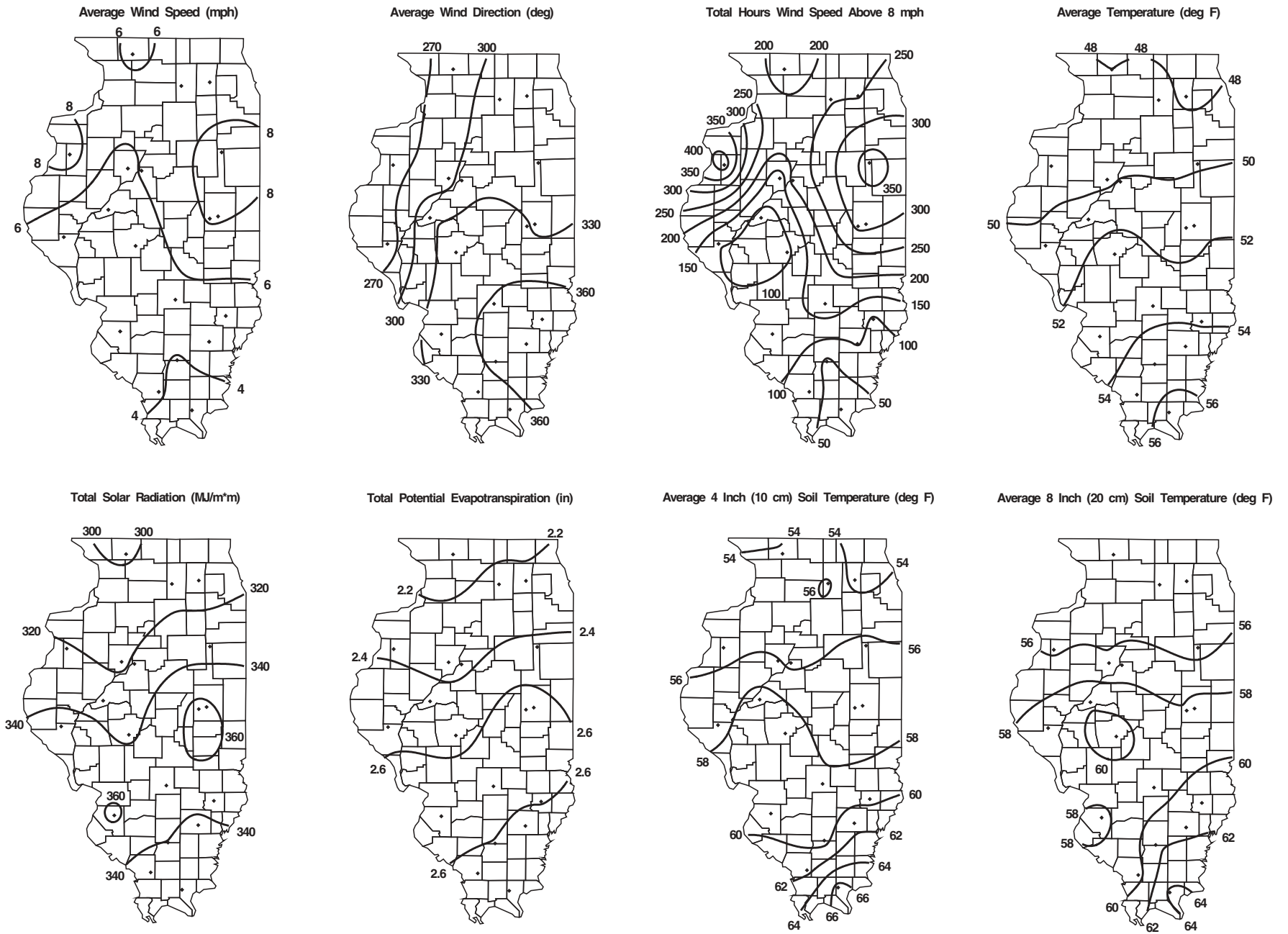


Figure 3. October monthly averages and totals as collected by the Illinois Climate Network

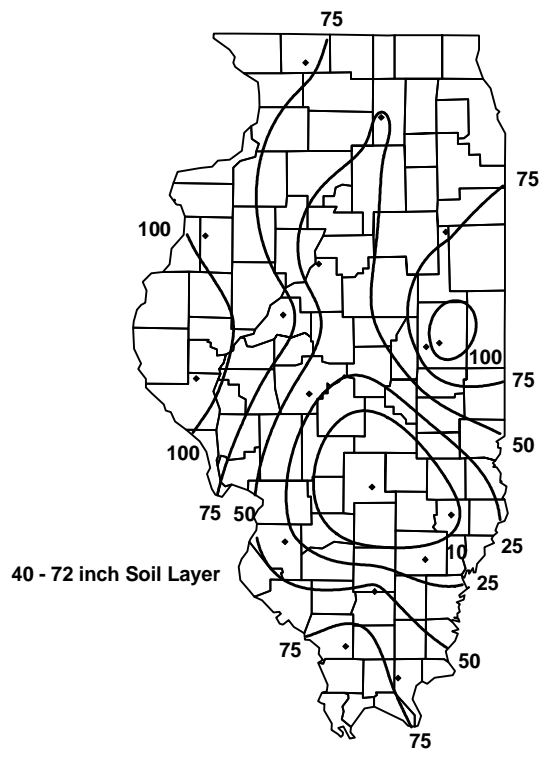
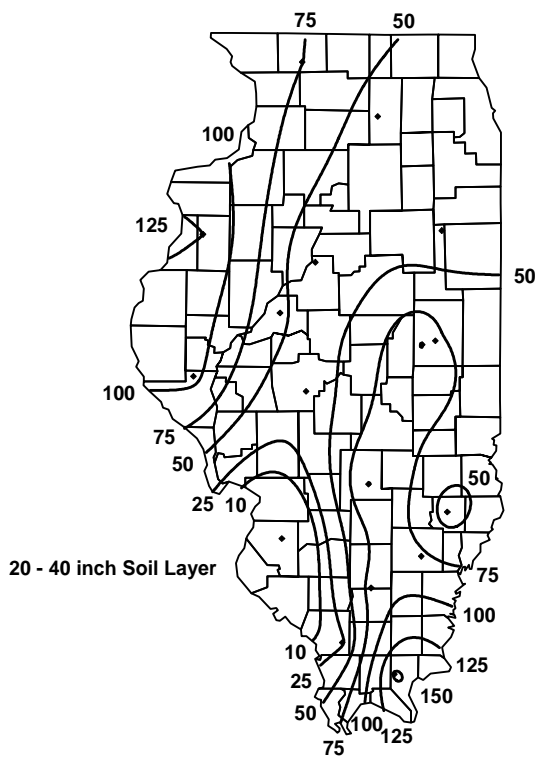
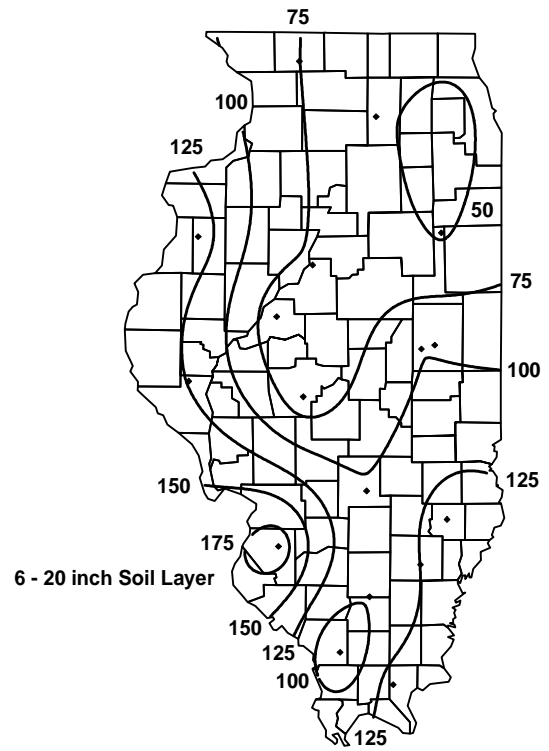
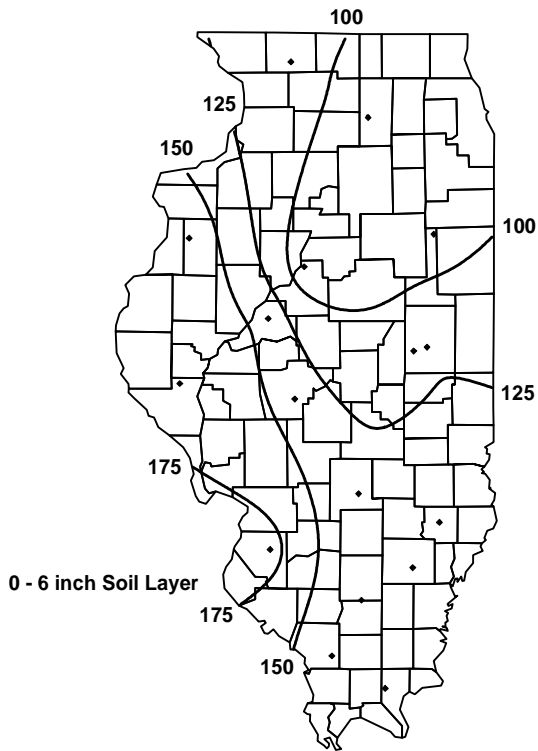


Figure 4. November 1 observed percent-of-normal soil moisture based on 1985-1995 mean

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

<i>Location</i>	<i>Nov 1 0 - 6 (inches)</i>	<i>Change from Oct 1 (%)</i>	<i>Nov 1 6 - 20 (inches)</i>	<i>Change from Oct 1 (%)</i>	<i>Nov 1 20 - 40 (inches)</i>	<i>Change from Oct 1 (%)</i>
Freeport (NW)	1.9	94	3.6	34	6.1	-2
DeKalb (NE)	1.9	36	3.3	2	5.7	-1
Monmouth (W)	2.2	68	4.1	2	6.0	-5
East Peoria (C)	1.4	41	3.7	-2	6.5	-5
Topeka (C)	1.0	86	1.7	-1	2.2	-23
Stelle (E)	1.7	22	3.4	-4	4.8	-3
Champaign (E)	2.1	49	4.6	4	5.2	-9
Bondville (E)	2.0	24	4.1	6	7.0	-3
Perry (WSW)	2.2	108	4.5	27	6.9	-1
Springfield (WSW)	2.1	37	4.4	8	6.5	-1
Brownstown (ESE)	1.9	104	3.0	56	6.9	14
Olney (ESE)	2.0	62	4.4	32	6.3	0
Belleville (SW)	2.3	81	5.1	284	5.0	6
Carbondale (SW)	1.9	0	2.6	24	5.1	1
Ina (SE)	2.1	34	4.9	12	7.4	1
Fairfield (SE)	2.1	59	5.1	44	6.9	7
Dixon Springs (SE)	2.4	0	5.5	3	8.1	5

### 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 between October 17 and 21 that were below flood stage. The Ohio River at Cairo peaked well below flood stage on October 1.

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 October mean flow for each year of record and selecting the middle value, 50 percent exceedence probability.

Mean provisional flow statewide was near the median this month (91 percent of the median) and below the mean (37 percent of the mean). Stations in northwestern Illinois recorded mean October flows in the normal to above normal range. The Kankakee River at Momence was much below normal for the fourth consecutive month. Throughout the remainder of Illinois, recorded flows were in the normal to below normal range for October.

**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 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

**Table 3. Peak Stages for Major Rivers, October 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	5.4	22
	La Salle	224.7	20	11.8	05
	Peoria	164.6	18	12.5	07
	Havana	119.6	14	6.3	08
	Beardstown	88.6	14	9.9***	02***
	Hardin	21.5	25	19.7	25
Mississippi	Dubuque	579.9	17	13.4	17
	Keokuk	364.2	16	8.0	19
	Quincy	325.0	17	12.3	15
	Grafton	218.0	18	16.0	16
	St. Louis	180.0	30	9.4	19
	Chester	109.9	27	11.1	20
	Thebes	43.7	33	15.2	21
Ohio	Cairo	2.0	40	23.9	01

**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.

\*\*\* Data unavailable October 11-16.

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 column 8.

Compared to levels at the end of September at 36 reservoirs, the water surface elevation at the end of October had risen at 8 reservoirs and decreased at 25 reservoirs. The reported elevation was the same as last month at 3 reservoirs. For the 37 reservoirs reporting at the end of October, one reservoir had water surface levels above the normal pool (or target operating level), 5 reservoirs were at normal pool, and 31 reservoirs were below normal pool. Six reservoirs were 3 feet or more below normal/target pool. The water level at Kinkaid reservoir was lowered to accommodate spillway work.

**Note:** The water surface level at Raccoon Lake was incorrectly reported in Table 5 of the September 2002 *Water and Climate Summary*. The level at the end of September was actually -3.4 feet below target level.

**Major Reservoirs.** Water levels at Lake Shelbyville, Rend Lake, and Carlyle Lake each declined approximately half a foot to just below the respective target levels. Both Carlyle Lake and Lake Shelbyville will be operated at lower seasonable target levels beginning in December.

**Great Lakes.** Current month mean and end-of-month values are provisional and are relative to International Great Lakes Datum 1985. The October mean level for Lake Michigan was 577.9 feet, compared to a mean level of 577.5 feet in 2001. The long-term average lake level for October is 579.1 feet, based on 1918–1998 data. Historically, the lowest mean level for Lake Michigan in October occurred in 1964 at 576.4 feet, and the highest level occurred in 1986 at 582.3 feet. The month-end level of Lake Michigan was 577.6 feet.

**Table 4. Provisional Mean Flows, October 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	67	3,819	3,088	2,692	normal	31	27
Rock River near Joslin	9,549	59	5,025	4,527	3,898	normal	36	31
Pecatonica River at Freeport	1,326	83	973	694	587	above normal	18	28
Green River near Geneseo	1,003	63	166	388	216	normal	62	26
Edwards River near New Boston	445	64	61	142	46	normal	44	27
Kankakee River at Momence	2,294	84	530	1,190	909	much below normal	94	29
Iroquois River near Chebanse	2,091	78	110	685	176	normal	61	31
Fox River at Dayton	2,642	82	840	1,124	791	normal	49	31
Vemilion River at Pontiac	579	58	20	133	18	normal	48	30
Spoon River at Seville	1,636	85	108	539	185	below normal	71	31
LaMoine River at Ripley	1,293	78	50	431	118	below normal	75	31
Bear Creek near Marceline	349	57	5	112	13	normal	68	29
Mackinaw River near Congerville	767	53	48	191	30	normal	42	31
Salt Creek near Greenview	1,804	60	328	516	194	normal	32	31
Sangamon River at Monticello	550	89	14	172	34	below normal	73	31
South Fork Sangamon near Rochester	867	52	10	198	25	normal	65	31
Illinois River at Valley City	26,743	63	7,601	12,710	8,053	normal	60	17
Macoupin Creek near Kane	868	73	43	233	52	normal	51	31
Vemilion River near Danville	1,290	58	100	325	104	normal	55	31
Kaskaskia River at Vandalia	1,940	32	219	643	259	normal	53	30
Shoal Creek near Breese	735	58	43	179	38	normal	48	30
Embarras River at Ste. Marie	1,516	88	35	433	103	below normal	84	16
Skilllet Fork at Wayne City	464	82	3.9	95	11	normal	68	31
Little Wabash below Clay City	1,131	87	14	212	50	below normal	75	31
Big Muddy at Plumfield	794	87	47	103	45	normal	48	31
Cache River at Forman	244	78	25	487	16	normal	40	31

**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 15 observation wells, which are remote from pumping centers, were below average levels for October by 1.2 feet and ranged from 16.1 feet below to 5.6 feet above average (Table 6). Water levels at Cambridge (Henry County) have continued to drop to another record low for the second continuous month.

**Comparison to Previous Month.** Shallow groundwater levels were below those of September. Levels averaged 0.4 feet below those of last month and ranged from 6.6 feet lower to 5.7 feet higher.

**Comparison to Same Month, Previous Year.** Shallow groundwater levels in October were below levels of October 2001. Levels averaged 3.4 feet lower and ranged from 17.3 feet lower to 6.4 feet above levels of last year.

**Table 6. Month-End Shallow Groundwater Level Data Sites, October 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	25.0	N/A	N/A	N/A	N/A	N/A
2	Mt. Morris	Ogle	55.0	21.71	-2.55	-2.21	N/A	N/A
3	Crystal Lake	McHenry	18.0	5.80	-0.03	-0.02	N/A	N/A
4	Cambridge	Henry	42.0	27.29	-15.49	-16.14	-6.62	-17.30
5	Fermi Lab	DuPage	17.0	9.11	-2.00	-2.17	-0.75	-5.90
6	Good Hope	McDonough	30.0	9.16	+2.56	+1.54	N/A	N/A
7	Snicarte	Mason	42.0	31.34	+5.11	+5.63	+5.72	+6.40
8	Coffman	Pike	28.0	14.14	+0.30	+0.22	+0.17	-3.43
9	Greenfield	Greene	20.70	16.36	-0.76	-0.97	-0.50	-4.06
10	Janesville	Cumberland	11.0	7.24	-0.92	-0.89	-0.05	-2.66
11	St. Peter	Fayette	15.0	5.96	-1.67	-1.73	+0.33	-3.12
12	SWS #2	St. Clair	80.0	N/A	N/A	N/A	N/A	N/A
13	Boyleston	Wayne	23.0	8.76	-1.07	-0.91	-1.02	-6.77
14	Sparta	Randolph	27.0	8.80	+1.25	+1.55	+0.89	-2.38
15	SE College	Saline	10.19	8.30	-0.37	-0.93	+1.01	-1.67
16	Dixon Springs	Pope	8.63	5.44	+1.63	-0.31	-2.58	-0.83
17	Bondville	Champaign	21.0	6.17	-0.57	-0.69	-0.85	+0.69
Averages					-0.97	-1.20	-0.35	-3.42

**Note:**

N/A = not available.

## Addendum

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

**Imperial Valley Precipitation.** October 2002 precipitation amounts (Figure 5a) were very light. Amounts were heaviest in the southwestern corner and eastern portions of the network, and lightest in the northwestern region. Individual gauge totals ranged from 2.19 inches at site #16 to 1.29 inches at site #8. The 30-year, 1971–2000, average precipitation amounts for October at Havana and Mason City are 2.86 and 2.73 inches, respectively. The October 2002 network average of 1.65 inches is about 67 percent of the 10-year (1992–2001) October network average of 2.46 inches.

**Cook County Precipitation.** October 2002 precipitation amounts (Figure 5b) also were very light. Precipitation was heaviest in the east-central portion of the network and lightest in the northwestern and southwestern corners of the network. Precipitation values ranged from 2.31 inches at site #13 (near 75th Street) to 1.14 inches at site #24 (Matteson). The October 2002 network average of 1.79 inches is about 53 percent of the 13-year (1989–2001) October network average of 3.40 inches.

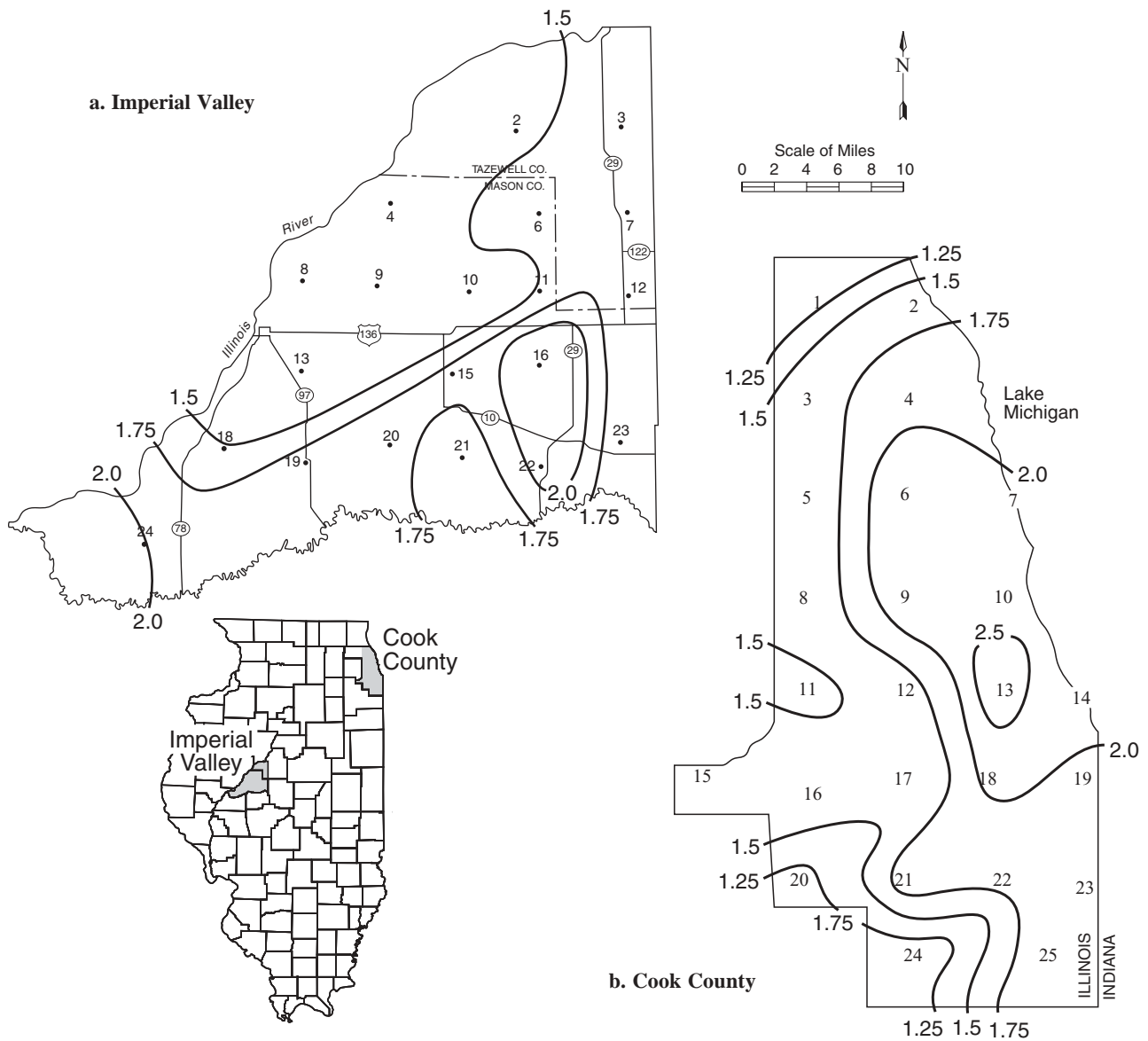


Figure 5. Long-term raingage network precipitation totals (inches) for October 2002

**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/>
- MRCC - 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/>