

ILLINOIS WATER AND CLIMATE SUMMARY February 2006

February 2006 Overview (Bob Scott)

Temperatures in Illinois during February were average, but precipitation was well below average. Soil moisture within the top 40 inches was below the long-term statewide average. Mean streamflows were below median heights. Shallow groundwater levels continued to be below long-term average depths. Over the last 12 months, statewide precipitation was the third driest such period since 1895.

Temperatures across Illinois (Figure 1) for February were average (a 0.0-degree departure). Crop Reporting District (CRD) temperatures ranged from 1.2 degrees below average (southeast) to 1.2 degrees above average (east).

Precipitation amounts for Illinois in February were well below average across the state (Figure 1). The statewide average of 0.94 inches represents a -0.99-inch departure or 49 percent of average. The west CRD received the least rainfall, 0.38 inches (23 percent of average), while the southeast CRD recorded the greatest regional rainfall total, 2.15 inches (74 percent of average). This was the 15th driest February since 1895. Regionally, the west and west-southwest CRDs each had the 5th driest February on record.

Soil moisture in the 0- to 40-inch (0- to 100-centimeter) layer at the end of February was below normal across Illinois except for near normal conditions in the far south. Deeper layers across central and northeastern Illinois continued to be very dry, but soil moisture was above normal in those layers in east-central and southern Illinois.

Mean provisional streamflow statewide was below the median flow in February, 46 percent of median (Figure 1). Rivers in Illinois recorded monthly mean discharges in the much below normal to normal range this month. Peaks on the major rivers did not exceed flood stage in February.

Water surface levels at the end of February were below the normal pool/target operating level at 20 of 37 reporting reservoirs. Lake Shelbyville and Carlyle Lake were 0.2 feet above target operational levels, and Rend Lake was 2 feet above its target operational level. Lake Michigan's mean level remains below the long-term average.

Statewide, **shallow groundwater levels** continue to be below normal by an average of 2.7 feet. Levels averaged 0.2 feet higher than January levels, and approximately 4.3 feet below February levels one year ago.

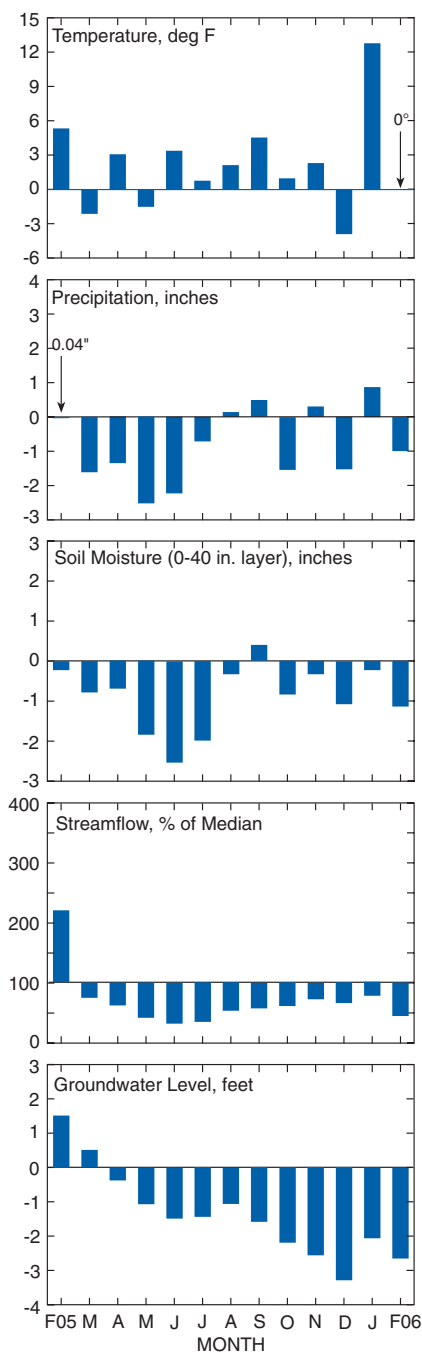


Figure 1.
Statewide departures from normal

Note: Extended network descriptions appear in the January and July issues. Network maps are available upon request.

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For more information, see www.sws.uiuc.edu/warm

Weather/Climate Information (Jim Angel and Bob Scott)

Temperatures across Illinois for February were slightly above normal in the north to slightly below normal in the south (Figure 2 and Table 1). Extremes ranged from 71°F on February 16 at Du Quoin to -16°F on February 18 at Mt. Carroll. It was the 12th warmest December–February, 4th warmest September–February, and 5th warmest March–February since 1895.

Precipitation for February was below normal statewide (Figure 2 and Table 1). Lawrenceville (Lawrence County) reported the highest one-day precipitation, 1.89 inches on February 17, and Grayville (White County) reported the highest monthly total, 3.01 inches. Snowfall was well below normal across northern and central Illinois and above normal only in southern Illinois. Grayville reported 8.9 inches, the highest monthly total of any site. Statewide, it was the 15th driest February, 22nd driest December–February, 27th driest September–February, and 3rd driest March–February since 1895.

Severe weather was reported in Illinois only on February 16 ahead of a strong cold front pushing through the state. A tornado reported near Atwood (Piatt County) did no damage, but another tornado near Watseka (Iroquois County) damaged a construction trailer. There were widespread reports of hail—most of it nickel to quarter size in diameter—across southern and central Illinois. High winds associated with the passage of these storms also damaged trees and power lines.

Illinois Climate Network (ICN) Data. Average daily wind speeds across Illinois for February (Figure 3) ranged from 5 mph at Dixon Springs and Kilbourne to 12 mph at Bondville and Stelle. Highest gusts during the month were recorded at Bondville, Monmouth, Stelle, and Carbondale (42 mph on February 16). The prevailing wind direction was westerly to west-northwesterly statewide. Wind speeds in excess of 8 mph varied from 121 hours at Rend Lake to more than 513 hours at Stelle. (February has 672 hours.) Average air temperatures ranged from the middle 20s (northern Illinois) to the middle 30s (southern Illinois).

Solar radiation totals in February varied from 271 Mega-Joules per meter squared (MJ/m²) at St. Charles to nearly 350 MJ/m² at Bondville. Potential evapotranspiration observations varied from a low of 1.3 inches at St. Charles to 1.9 inches at Bondville and Belleville. Soil temperatures at the 4-inch level ranged from 29°F at Big Bend to 41°F at Dixon Springs and Carbondale, with similar temperatures at the 8-inch level, ranging from 33°F at Monmouth, Freeport, and Big Bend to 43°F at Dixon Springs.

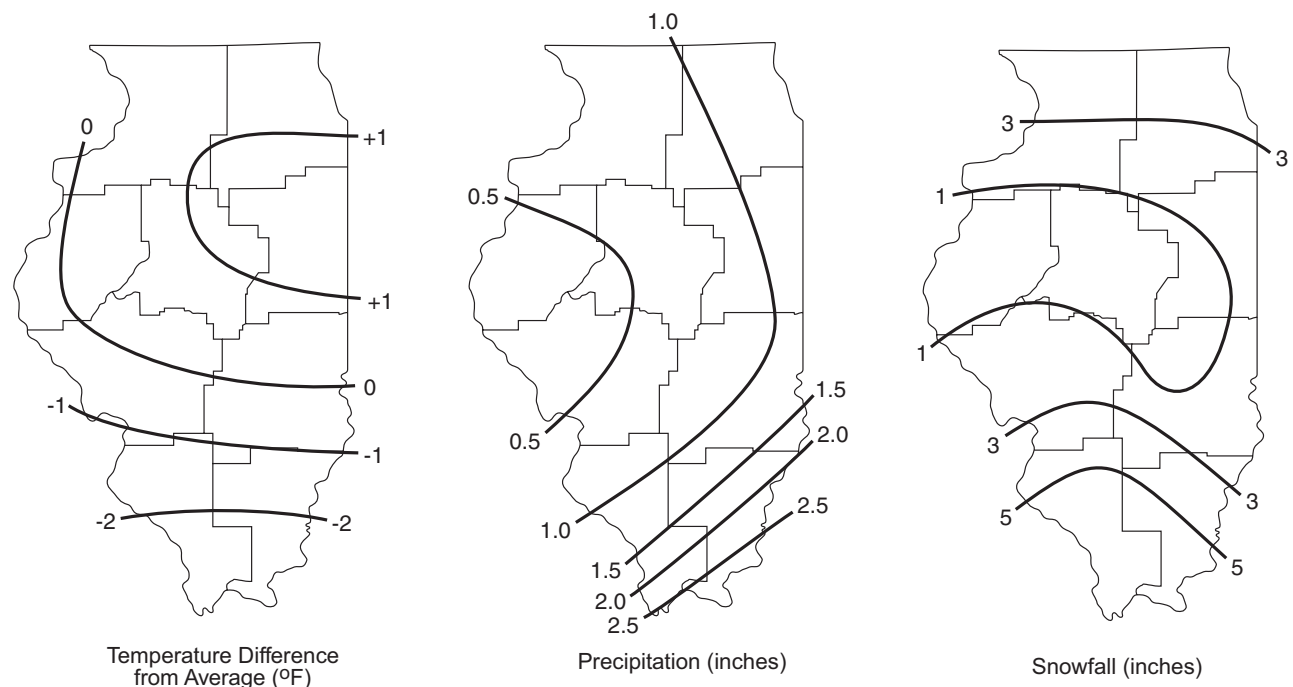


Figure 2. Illinois temperature, precipitation, and snowfall during February 2006

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

Crop Reporting District	<u>Last Month</u>			<u>Last 3 Months</u>			<u>Last 6 Months</u>			<u>Last 12 Months</u>		
	Feb 06 Amount	% Avg	Temp Dev	Dec 05-Feb 06	% Avg	Temp Dev	Sep 05-Feb 06	% Avg	Temp Dev	Mar 05-Feb 06	% Avg	Temp Dev
Northwest	0.76	52	0.4	4.45	91	3.2	10.23	75	3.2	22.52	62	2.2
Northeast	1.10	73	0.6	5.32	97	3.1	11.25	78	3.1	23.74	65	2.1
West	0.38	23	0.2	4.18	78	3.5	11.94	81	3.1	25.36	68	2.1
Central	0.61	36	0.7	4.58	79	3.4	12.39	84	3.1	24.01	65	2.1
East	0.84	49	1.2	4.59	76	3.2	13.99	94	2.8	29.46	78	1.7
West-southwest	0.44	23	-0.3	3.74	58	3.0	13.75	87	2.6	25.78	68	1.7
East-southeast	1.06	47	-0.4	5.57	72	2.8	15.51	88	2.4	31.90	78	1.5
Southwest	1.54	61	-1.1	5.49	64	2.8	17.81	93	2.5	36.63	86	1.4
Southeast	2.15	74	-1.2	7.33	77	2.5	17.55	88	2.5	39.83	90	1.5
State Average	0.94	49	0.0	4.95	76	3.1	13.64	85	2.8	28.28	73	1.8

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 both March and climatological spring (March–May) call for equal chances of above, below, and normal temperatures and precipitation across the state.

Soil Moisture Information (Bob Scott)

Precipitation totals in Illinois during February were below average across the state, resulting in near-surface soil moisture that was below normal in all but far southern Illinois (Figure 1). Values in the 0- to 6-inch layer ranged from 49 percent of normal at Stelle to 105 percent at Dixon Springs. Similar patterns were observed in deeper layers. Values ranged from 68 to 109 percent at DeKalb and Dixon Springs, respectively, in the 6- to 20-inch layer, and from 42 to 115 percent at DeKalb and Rend Lake in the 20- to 40-inch layer. Moisture variability was greatest in the deepest layer. Soils 40 to 72 inches deep remained very dry across central and northeastern Illinois, but wet in eastern and southern areas. Site values ranged from less than 10 percent at Peoria and DeKalb to 145 percent of normal at Rend Lake. Overall, soil moisture in Illinois at the end of February was below normal (Figure 2).

Compared to end-of-January conditions, soil moisture generally decreased across most of Illinois in February (Table 1). Decreases of 10 to 30 percent were widespread in the 0- to 6-inch layer, with Stelle and Champaign reporting the largest drops in moisture. Conversely, Olney and Dixon Springs measured increases of just over 10 percent. Most sites reported small decreases in the 6- to 20-inch layer, maximizing with a 13 percent drop at Topeka. Small changes (generally 10 percent or less) dominated moisture values in the 20- to 40-inch layer, with a similar 13 percent decrease at Topeka.

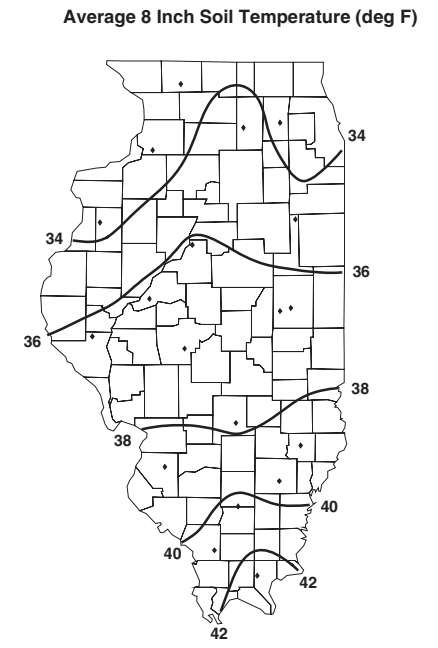
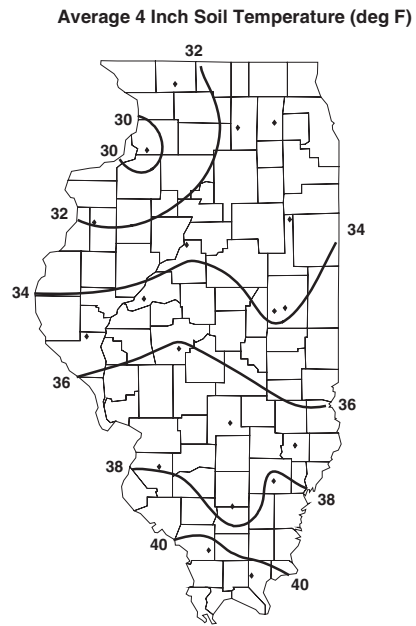
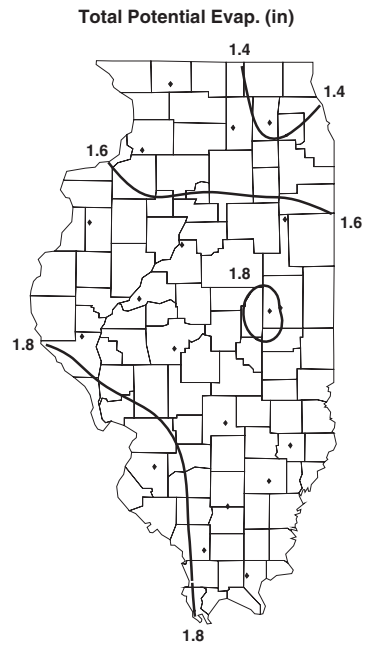
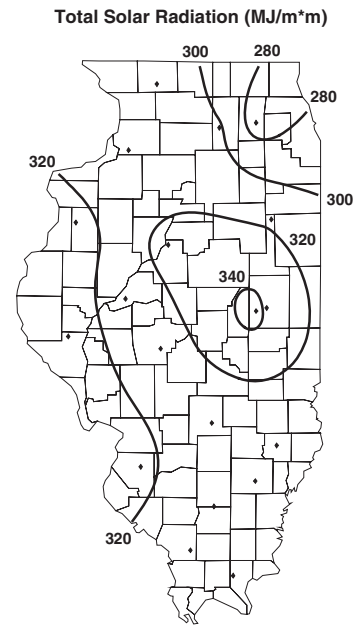
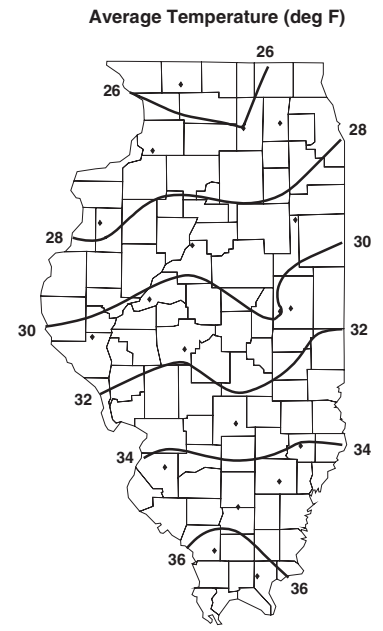
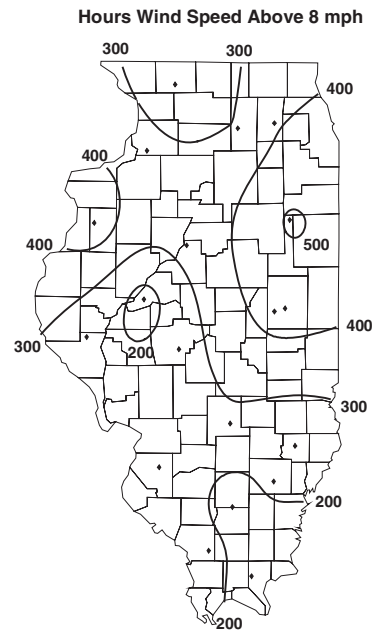
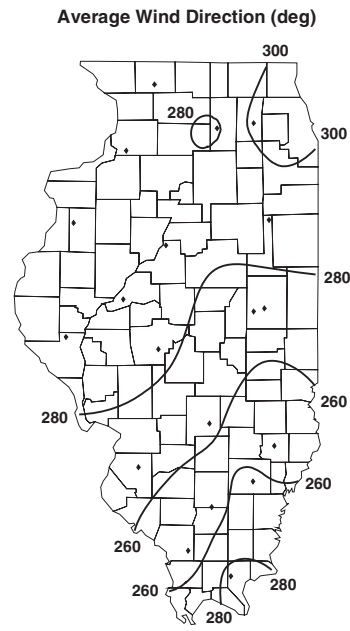
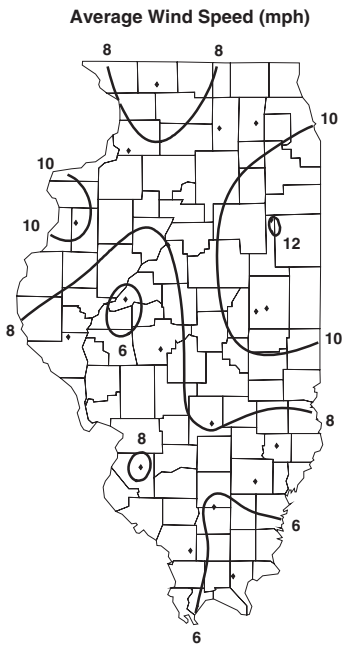
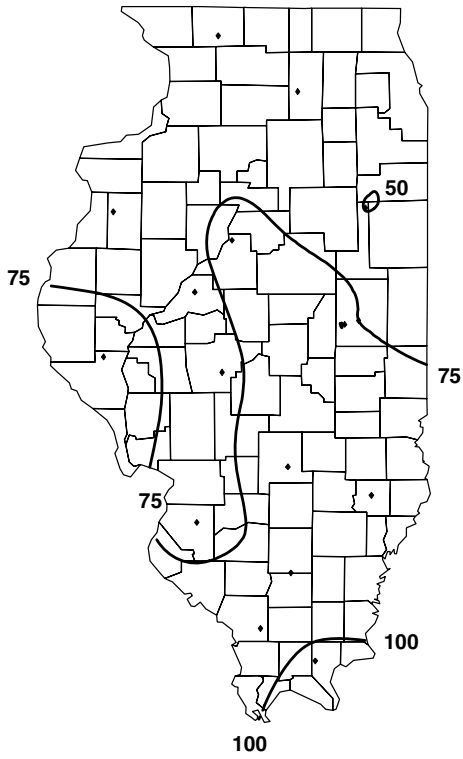
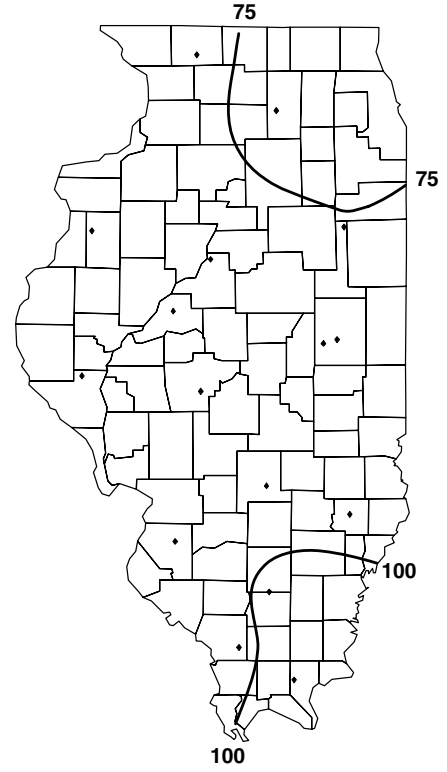


Figure 3. February monthly averages and totals as collected by the Illinois Climate Network

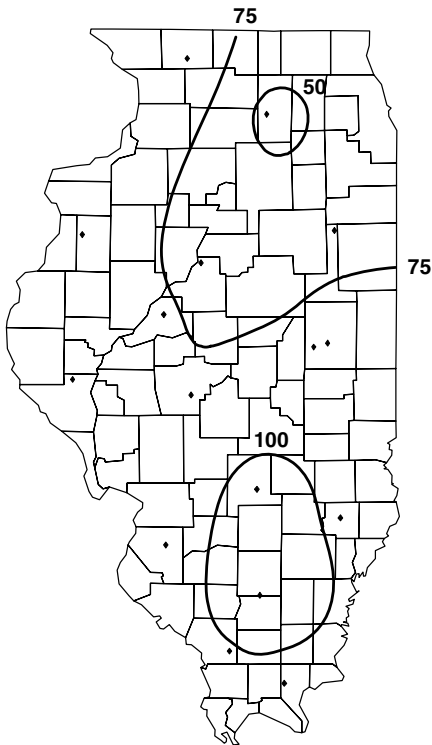
0 - 6 inch Soil Layer



6 - 20 inch Soil Layer



20 - 40 inch Soil Layer



40 - 72 inch Soil Layer

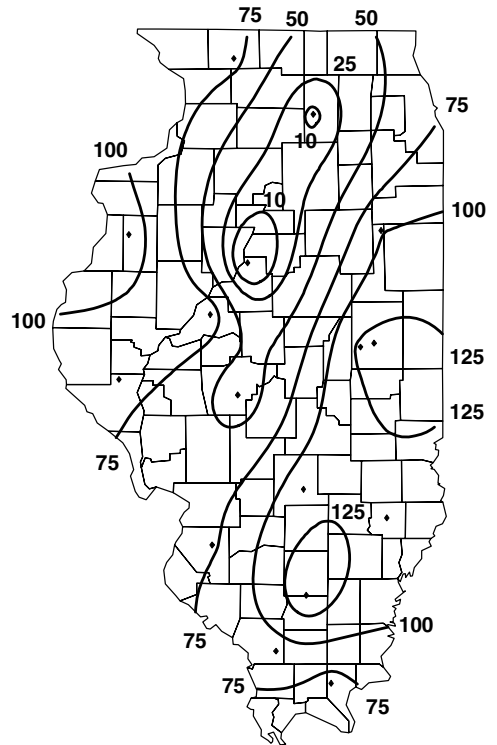


Figure 4. March 1 observed percent-of-normal soil moisture based on 1985-1995 mean

Table 2. Soil Moisture in Various Layers on March 1, 2006

<i>Location</i>	<i>Mar 1 0 - 6 (inches)</i>	<i>Change from Feb 1 (%)</i>	<i>Mar 1 6 - 20 (inches)</i>	<i>Change from Feb 1 (%)</i>	<i>Mar 1 20 - 40 (inches)</i>	<i>Change from Feb 1 (%)</i>
Freeport (NW)	1.9	0	4.3	-4	6.7	-4
DeKalb (NE)	1.8	-13	4.2	-11	6.0	7
Monmouth (W)	1.7	-16	4.3	-8	6.4	-6
East Peoria (C)	1.9	-24	4.9	-4	7.4	-3
Topeka (C)	1.1	-20	2.5	-13	2.9	-13
Stelle (E)	1.6	-27	4.6	-6	6.2	5
Champaign (E)	1.7	-27	4.7	-9	6.2	-3
Bondville (E)	2.3	-9	5.2	3	7.6	-3
Perry (WSW)	2.0	-7	5.1	-3	7.2	-5
Springfield (WSW)	1.8	-10	4.9	-1	7.6	1
Brownstown (ESE)	2.3	2	4.6	-1	8.3	0
Olney (ESE)	2.4	10	4.7	-1	6.9	-3
Belleville (SW)	1.8	-22	4.6	-12	8.0	-8
Carbondale (SW)	2.5	-12	5.3	-2	8.1	0
Ina (SE)	2.5	-8	5.3	0	7.7	1
Fairfield (SE)	2.5	-11	5.4	-3	7.4	-1
Dixon Springs (SE)	2.7	13	5.6	4	8.1	-1

Surface Water Information (Bill Saylor and Vern Knapp)

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 (ISWS), and the USACE. Provisional discharge data are obtained from 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 readings posted by the National Weather Service and/or the USACE. Peak stages at the stations listed in Table 3 were below flood stage in February.

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

The statewide percent of historical mean flow and percent of historical median flow are calculated by dividing the sum of the average flows this month at stations in Table 4 by the sum of the historical mean and median flows calculated for the month, respectively, at the same stations. This method is intended to weight individual observations proportionately in the aggregate comparison. (The Illinois River and Rock River stations are excluded from the statewide calculation because other rivers listed in Table 4 contribute to their flow.)

Mean provisional flow statewide was below the median this month (46 percent of the median) and below the long-term mean (37 percent of the mean). Mean streamflow conditions for the month ranged from much below normal (particularly in western Illinois) to normal. Streamflow at the South Fork Sangamon River near Rochester is being diverted into Lake Springfield upstream of the streamgaging location.

Table 3. Peak Stages for Major Rivers during February 2006

<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	6.5	01
	La Salle	224.7	20	13.8	01
	Peoria	164.6	18	13.0	02
	Havana	119.6	14	8.8	05
	Beardstown	88.6	14	10.6	05
	Hardin	21.5	25	20.3	09
Mississippi	Dubuque	579.9	17	9.1	27
	Keokuk	364.2	16	4.6	17
	Quincy	327.9	17	11.7	16
	Grafton	218.0	18	16.2	18
	St. Louis	180.0	30	3.0	01
	Chester	109.9	27	5.9	01
	Thebes	43.7	33	12.2	03
Ohio	Cairo	2.0	40	33.9	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, August 2004 (except as revised by the National Weather Service).

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

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

Compared to end-of-January levels at 36 reservoirs, end-of-February levels had decreased at 26 reservoirs, had risen at 6 reservoirs, and were the same as last month at 4 reservoirs. For the 37 reservoirs with observations reported at the end of February, 11 reservoirs were above normal pool (or target operating level), 6 reservoirs were at normal pool, and 20 reservoirs were below normal pool.

Major Reservoirs. Compared to end-of-January water levels, end-of-February levels had decreased 0.3–0.4 feet at Lake Shelbyville and Carlyle Lake, but had increased 0.6 feet at Rend Lake. At the end of February, the water surface level at Rend Lake was about 2 feet above the target level, and Carlyle Lake and Lake Shelbyville were each 0.2 feet above winter target levels.

Great Lakes. Current month mean and end-of-month values are provisional and are relative to International Great Lakes Datum 1985. The February mean level for Lake Michigan was 577.2 feet, compared to a mean level of 577.8 feet in February 2005. The long-term average lake level for February is 578.4 feet, based on 1918–2005 data. Historically, the lowest mean level for Lake Michigan in February occurred in 1964 at 576.1 feet, and the highest level occurred in 1986 at 581.1 feet. The month-end level of Lake Michigan was 577.1 feet.

Table 4. Provisional Mean Flows, February 2006

Station	Drainage area (sq mi)	Years of record	2006 mean flow (cfs)	<u>Long-term flows</u>		Flow condition	Percent chance of exceedence	Days of data this month
				Mean*	Median			
Rock River at Rockton	6363	70	3469	3859	3344	normal	45	28
Rock River near Joslin	9549	62	4664	6365	5521	normal	60	28
Pecatonica River at Freeport	1326	86	426	1114	906	much below normal	90	28
Green River near Geneseo	1003	66	154	749	655	much below normal	90	28
Edwards River near New Boston	445	67	37	365	304	much below normal	93	28
Kankakee River at Momence	2294	88	1866	2488	2490	normal	62	28
Iroquois River near Chebanse	2091	81	1159	2524	2159	normal	66	26
Fox River at Dayton	2642	86	1463	2045	1635	normal	53	28
Vermilion River at Pontiac	579	61	207	508	363	normal	60	28
Spoon River at Seville	1636	88	133	1446	1279	much below normal	93	28
LaMoine River at Ripley	1293	81	76	1044	747	much below normal	94	28
Bear Creek near Marceline	349	60	13	265	166	much below normal	90	28
Mackinaw River near Congerville	767	56	104	632	495	below normal	81	28
Salt Creek near Greenview	1804	63	436	1663	1346	below normal	78	28
Sangamon River at Monticello	550	92	225	581	433	normal	69	28
South Fork Sangamon near Rochester	867	55	4.1	882	600	much below normal	96	28
Illinois River at Valley City	26,743	66	11,750	24,370	22,946	normal	69	28
Macoupin Creek near Kane	868	76	35	752	460	much below normal	92	28
Vermilion River near Danville	1290	83	830	1427	1012	normal	57	28
Kaskaskia River at Vandalia	1940	35	620	2659	1848	below normal	83	28
Shoal Creek near Breese	735	61	113	905	532	below normal	84	28
Embarras River at Ste. Marie	555	91	1320	1915	1570	below normal	77	28
Skillet Fork at Wayne City	464	85	269	648	483	normal	69	28
Little Wabash below Clay City	1131	90	368	1519	1138	below normal	84	28
Big Muddy at Plumfield	794	34	680	1028	1027	normal	63	28
Cache River at Forman	244	81	422	492	434	normal	52	28

Notes:

N/A = not available.

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 2004.

Table 5. Reservoir Levels in Illinois, February 2006

For security considerations, statewide tabular reservoir data are not available on the Internet. Specific data requests may be made to Bill Saylor at: wsaylor@sws.uiuc.edu.

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 the 11th consecutive month. February levels were below average by 2.7 feet and ranged from 9.3 feet below to 0.5 feet above average (Table 6). Only the Greenfield well (Greene County) reported the lowest February water level for its period of record.

Comparison to Previous Month. Shallow groundwater levels were above those of January. Levels averaged 0.2 feet higher and ranged from 1.3 feet below to 2.6 feet above levels last month.

Comparison to Same Month, Previous Year. Shallow groundwater levels in February were below levels of one year ago. Levels averaged 4.3 feet lower and ranged from 13.9 feet lower to zero feet above in February 2005.

Table 6. Month-End Shallow Groundwater Level Data Sites, February 2006

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	22.65	-1.30	-0.85	-0.25	-1.37
2	Mt. Morris	Ogle	55.00	29.59	-9.97	-8.99	-0.18	-7.71
3	Crystal Lake	McHenry	18.00	7.37	-2.50	-2.06	+0.31	-3.57
4	Cambridge	Henry	42.00	40.86*	N/A	N/A	N/A	N/A
5	Fermi Lab	DuPage	17.00	8.34	-3.02	-2.89	+1.28	-5.21
6	Good Hope	McDonough	30.00	10.95	-4.81	-3.68	-1.25	-7.56
7	Snicarte	Mason	40.30	39.88	-2.80	-2.64	+0.21	-5.36
8	Coffman	Pike	28.00	16.64	-7.92	-5.74	0.00	-12.35
9	Greenfield	Greene	20.70	18.64**	-9.99	-9.25	-0.16	-13.90
10	Janesville	Cumberland	11.00	5.47	-0.89	-0.84	-1.10	-0.64
11	St. Peter	Fayette	15.00	1.56	-0.12	+0.12	-0.56	-0.45
12	SWS #2	St. Clair	80.00	N/A	N/A	N/A	N/A	N/A
13	Boyleston	Wayne	23.00	1.86	-0.04	+0.22	-0.59	+0.03
14	Sparta	Randolph	27.00	5.56	-0.43	+0.46	-0.19	-1.96
15	SE College	Saline	10.19	2.33	-0.78	-0.85	+0.26	-0.91
16	Dixon Springs	Pope	8.63	3.31	-1.35	-1.88	+1.85	-1.28
17	Bondville	Champaign	21.00	4.20	-1.28	-1.36	+2.61	-1.92
Averages					-3.15	-2.68	+0.15	-4.28

Notes:

N/A = Data not available.

* Well not used for analyses.

** Lowest level of record for month.

Addendum (Nancy Westcott)

Imperial Valley Precipitation. February 2006 precipitation amounts (Figure 5a) were extremely light. Gage amounts were greatest in the northern and central portion of the network, and precipitation was lightest in the southwestern and southeastern regions of the network. Individual gage totals ranged from 0.41 inches at site #2 to 0.02 inches at site #19. The 30-year, 1971–2000, average precipitation amounts for February at Havana and Mason City are 1.94 and 1.53 inches, respectively. The February 2006 network average of 0.15 inches was about 9 percent of the 13-year (1993–2005) February network average of 1.66 inches, the lowest network average for any month in 13 years of network operation.

Cook County Precipitation. February 2006 precipitation amounts (Figure 5b) were low. The greatest precipitation was heaviest in the northern area of the network and lightest in the south-central portion of the network. Precipitation values ranged from 1.66 inches at site #2 (Winnetka) to 0.63 inches at site #18 (West 119th Street). The February 2006 network average of 1.14 inches was about 68 percent of the 16-year (1990–2005) February network average of 1.69 inches.

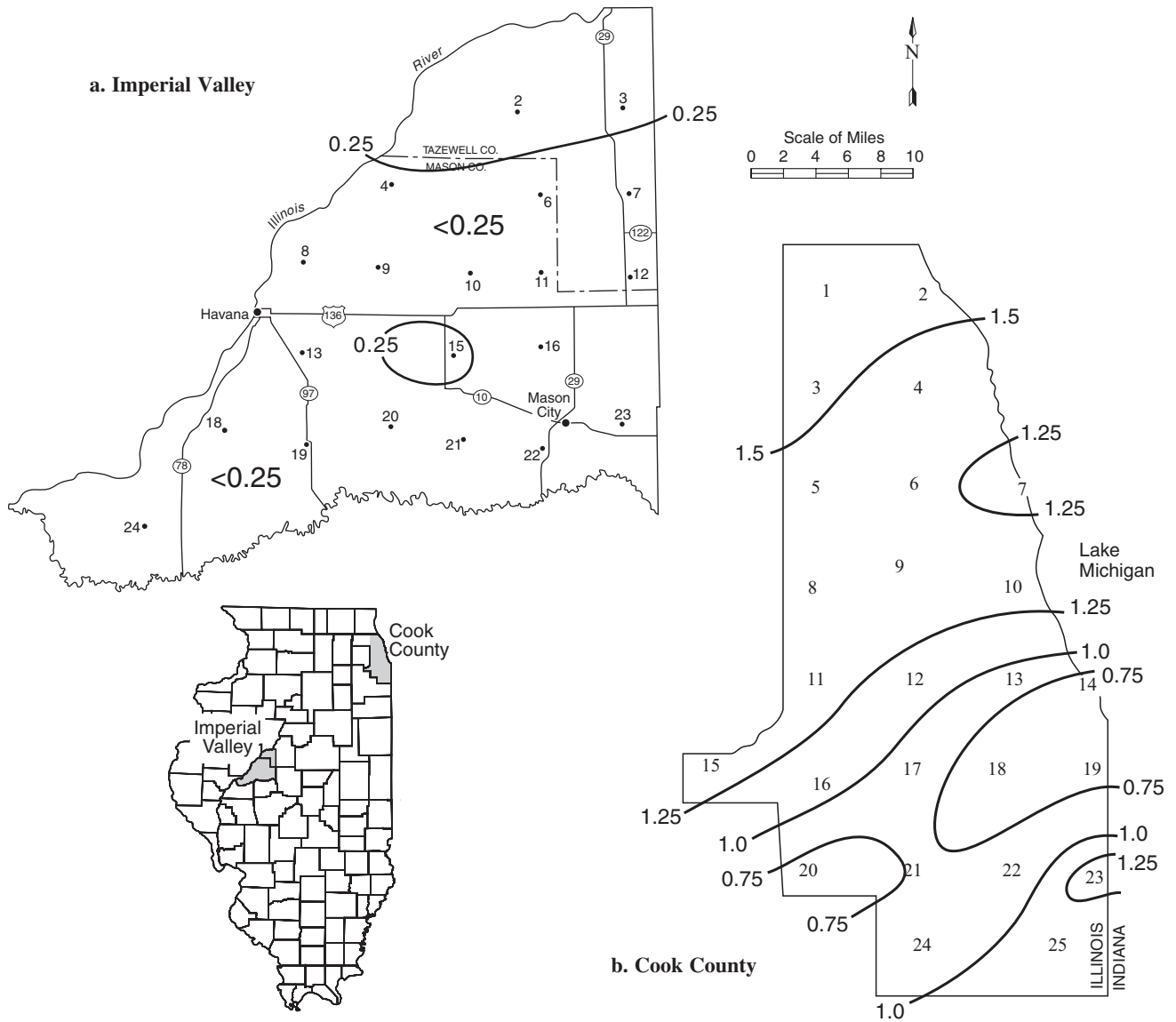


Figure 5. Long-term raingage network precipitation totals (inches) for February 2006

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 Corps of Engineers, <http://www.rivergages.com>

USGS - U.S. Geological Survey, <http://water.usgs.gov/>

WARM - Water and Atmospheric Resources Monitoring Program, <http://www.sws.uiuc.edu/warm/>

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