

ILLINOIS WATER AND CLIMATE SUMMARY February 2004

February 2004 Overview (Bob Scott)

Temperatures in Illinois during February were slightly below average. Precipitation was well below average, ranking as the 11th driest February since 1895. Soil moisture within the top 40 inches of soil was slightly above the long-term statewide average. Mean streamflows were below median heights. Shallow groundwater levels were below long-term average depths.

Temperatures across Illinois (Figure 1) for February were slightly below average (a -0.8-degree departure). Crop Reporting District (CRD) temperatures ranged from 1.7 degrees below average (southwest) to 0.1 degrees above average (northeast).

Precipitation amounts for the state were well below average (Figure 1). The statewide average of 0.81 inches represents a -1.17-inch departure or just 41 percent of average. In general, precipitation was lowest in central Illinois and highest in far southern and northern Illinois. Compared to average precipitation values for February, totals ranged from 30 percent of average in the east-southeast CRD (0.70 inches) to 72 percent of average in the northwest CRD (1.05 inches).

Soil moisture in the 0- to 40-inch (0- to 100-centimeter) layer at the end of February was slightly above normal. In general, moisture levels were near to above normal across Illinois in all layers, except for a region of very dry soils in the deepest soil layer over part of central Illinois.

Mean provisional streamflow statewide was below the median flow, 68 percent of median (Figure 1). Rivers in Illinois recorded mean discharges in the above to below normal range this month. Peak stages recorded at stations on the Illinois River and along the Illinois border on the Mississippi River did not exceed flood stage. The Ohio River at Cairo recorded a peak stage above flood stage.

Water surface levels at the end of February were below the normal pool/target operating level at 6 of 33 reporting reservoirs. Levels at Rend Lake, Lake Shelbyville, and Carlyle Lake were 0–1 foot above target levels. Lake Michigan's mean level remains below the long-term average.

Statewide, **shallow groundwater levels** continue to be below normal for the 18th consecutive month. Deviations from normal averaged 2.6 feet below average levels. Levels averaged 0.2 feet higher than those of January and were approximately 1.2 feet above February levels one year ago.

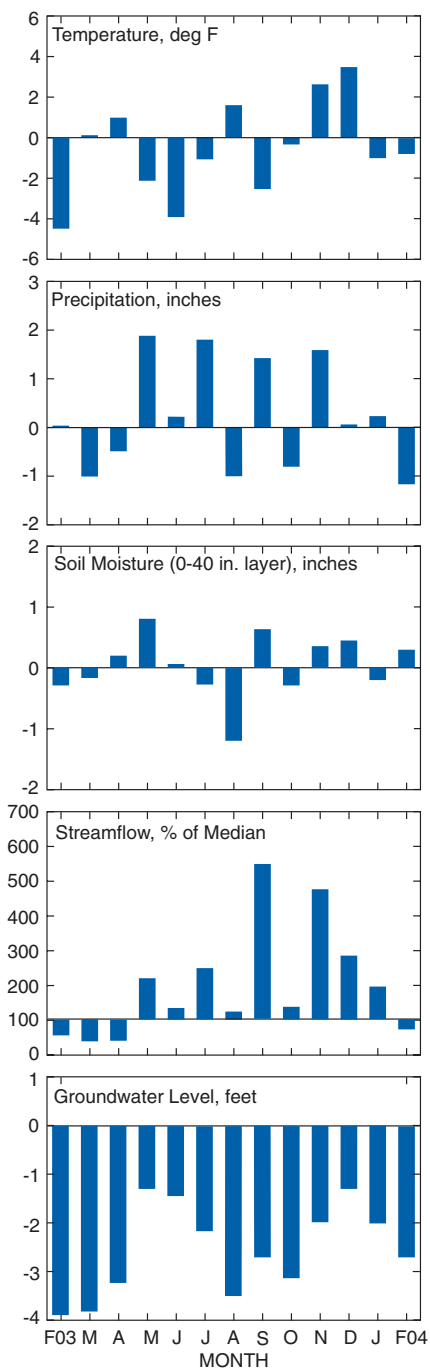


Figure 1.
Statewide departures from normal

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

Contact

Bob Scott: (217) 333-4966, email: rwscott1@uiuc.edu
For more information, see www.sws.uiuc.edu/warm

Weather/Climate Information (Jim Angel and Bob Scott)

Temperatures across Illinois for February were slightly below average (Figure 2 and Table 1). Extremes ranged from 68°F on February 28 at Stelle to -19°F on February 4 at Dixon.

Precipitation for February was well below average statewide (Figure 2 and Table 1). The 0.81-inch statewide average ranks as the 11th driest February since 1895. Anna (Union County) reported the highest one-day precipitation amount (0.80 inches), and Murphysboro (Jackson County) reported the highest monthly total (1.64 inches). Monthly totals in the east-southeast, southwest, and southeast CRDs ranked as the 8th, 9th, and 10th driest February, respectively, since 1895.

Snowfall for February was near normal in southern and northwestern Illinois and below normal across central Illinois. Totals ranged from 3–5 inches across southern and central Illinois to 5–11 inches in northern Illinois. Lake Villa, along the Illinois–Wisconsin border, reported the heaviest snowfall, 11.1 inches.

No **severe weather** was reported in Illinois during February.

Illinois Climate Network (ICN) Data. Average daily wind speeds across Illinois for February (Figure 3) ranged from 5 mph at Dixon Springs to 12 mph at Bondville and Stelle. The highest wind gusts for the month, 42 mph, were recorded at Bondville on February 20. The prevailing wind direction was from the southwest over central and northern Illinois, and from the west-northwest over southern Illinois. Wind speeds in excess of 8 mph varied from 120 hours at Dixon Springs to 530 hours at Monmouth. (February has 696 hours.) Average air temperatures ranged from the middle 20s to the middle 30s from north to south across the state.

Solar radiation totals in February showed seasonal increases, ranging from 269 Mega-Joules per meter squared (MJ/m^2) at St. Charles to 346 MJ/m^2 at Belleville. Potential evapotranspiration observations varied from 1.3 inches at St. Charles to 1.9 inches at Belleville, Carbondale, and Dixon Springs. Soil temperatures at the 4-inch and 8-inch levels ranged from the lower 30s in northern Illinois to the upper 30s in southern Illinois.

Extended climate outlooks issued by the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Climate Prediction Center for March and for climatological spring (March–May) call for equal chances of above, below, and normal temperatures and precipitation across Illinois.

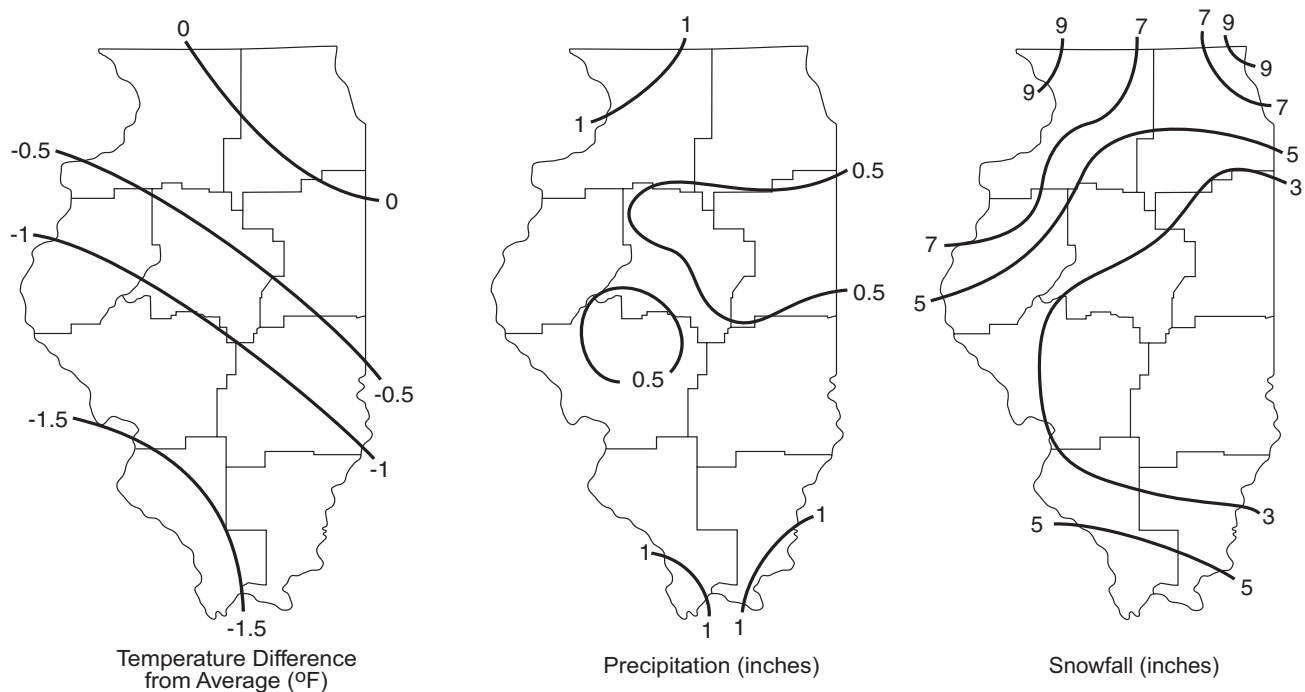


Figure 2. Illinois temperature, precipitation, and snowfall during February 2004

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

Crop Reporting District	Last Month			Last 3 Months			Last 6 Months			Last 12 months		
	Feb 04 Amount	% Avg	Temp Dev	Dec 03- Feb 04	% Avg	Temp Dev	Sep 03- Feb 04	% Avg	Temp Dev	Mar 03- Feb 04	% Avg	Temp Dev
Northwest	1.05	72	-0.2	4.84	99	1.1	13.44	98	0.8	32.00	88	0.1
Northeast	0.81	53	0.1	4.01	73	0.8	13.25	91	0.6	34.98	95	-0.1
West	0.74	43	-1.1	5.49	102	0.5	16.61	112	0.1	39.77	106	-0.2
Central	0.59	34	-0.7	4.02	69	0.7	13.93	94	0.3	37.07	100	-0.1
East	0.54	32	-0.2	4.77	79	0.8	15.58	104	0.4	41.58	111	-0.1
West-southwest	0.71	36	-1.0	6.18	95	0.6	19.00	121	0.2	44.20	117	-0.2
East-southeast	0.70	30	-1.2	7.69	99	0.3	20.96	119	0.2	44.76	109	0.0
Southwest	1.08	42	-1.7	7.25	85	0.3	17.22	90	0.4	40.50	95	0.0
Southeast	1.14	39	-1.3	7.10	74	0.2	17.00	85	0.5	39.97	90	0.2
State Average	0.81	41	-0.8	5.69	87	0.6	16.40	103	0.4	39.44	102	-0.1

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

Soil Moisture Information (Bob Scott)

Precipitation in Illinois for February was well below average. However, near surface soil moisture levels at the end of February were slightly below normal to slightly above normal statewide (Figure 4), a result of melting snows and thawing soils. Values in the 0- to 6-inch layer ranged from 66 percent of normal at Rend Lake to 130 percent of normal at Brownstown and Olney. Conditions were closer to normal in the 6- to 20-inch layer, where amounts ranged from 85 percent of normal at Rend Lake and Springfield to 115 percent of normal at Monmouth, Perry, and Stelle. Conditions in the 20- to 40-inch layer were near normal statewide, except for dry soils in central Illinois. Values in that layer ranged from less than 46 percent of normal at Peoria to 120 percent of normal at Monmouth and Champaign. The 40- to 72-inch layer also continued to show substantial variability, and values ranged from less than 20 percent of normal at Peoria to just over 130 percent of normal at Monmouth and Perry. Overall, soil moisture in Illinois at the end of February was slightly above normal (Figure 1).

Compared to the end of last month, moisture generally increased across the state in all soil layers (Table 2). Increases observed across northern and central Illinois in the 0- to 6-inch and 6- to 20-inch layers were 10–25 percent, compared to only small changes in the south. Small changes also dominated the 20- to 40-inch layer, except for increases of about 20 percent at DeKalb and Topeka.

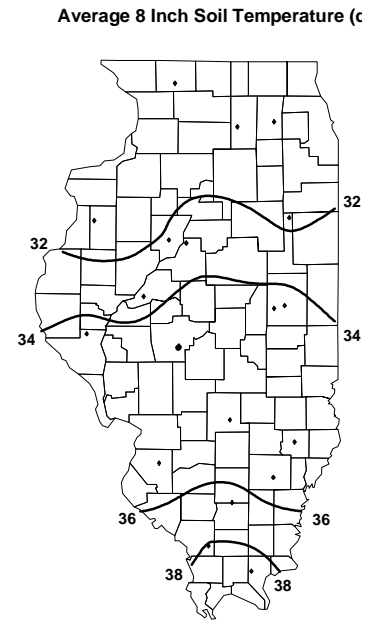
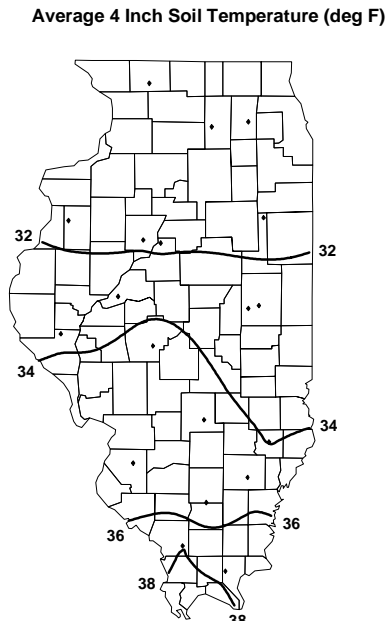
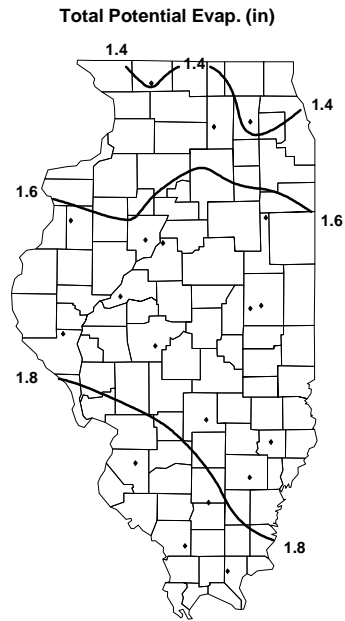
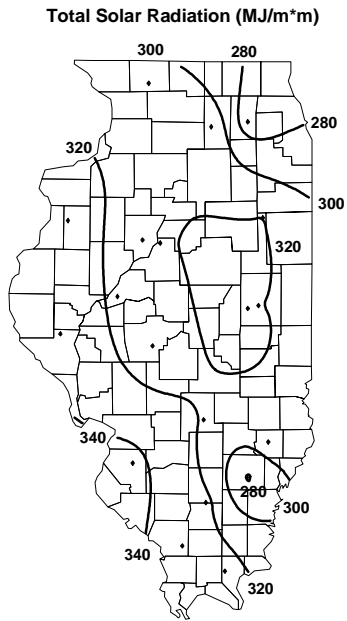
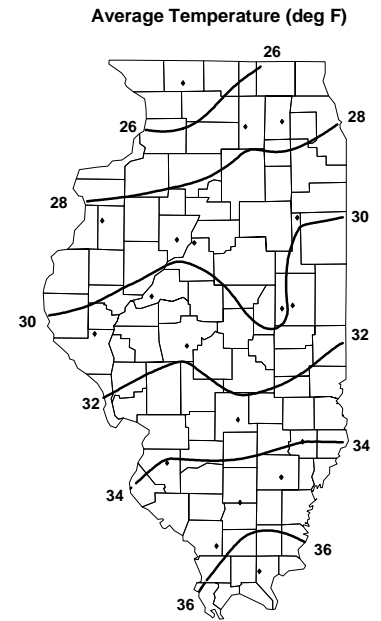
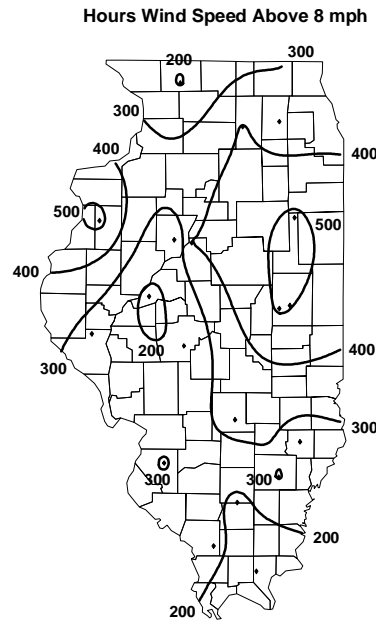
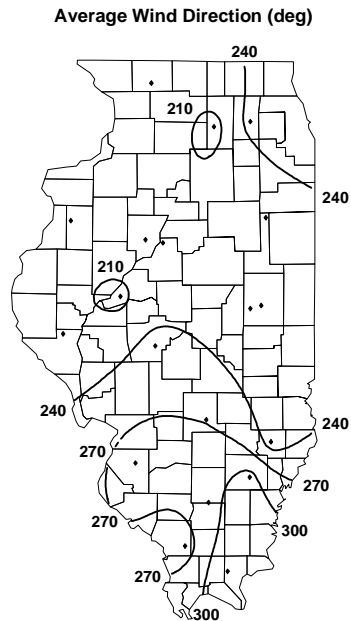
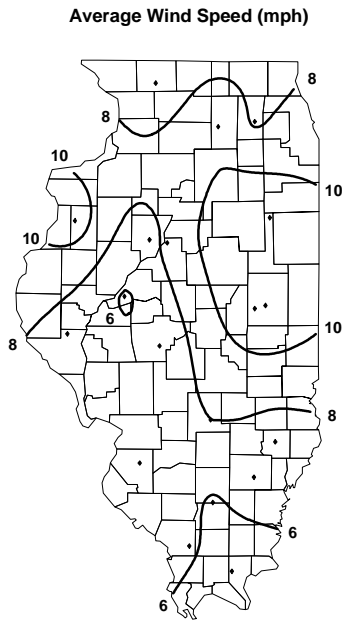
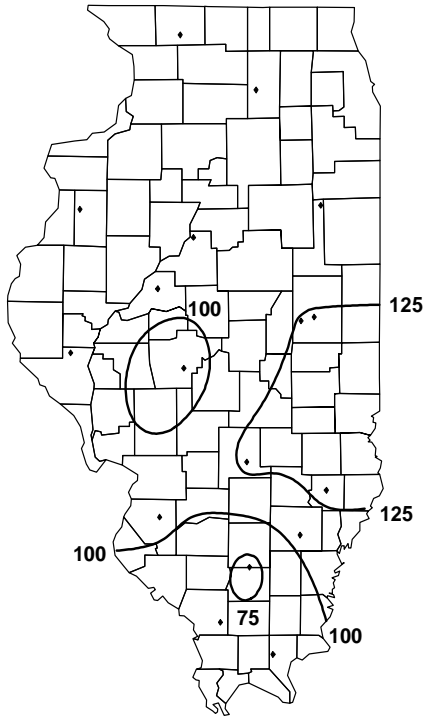
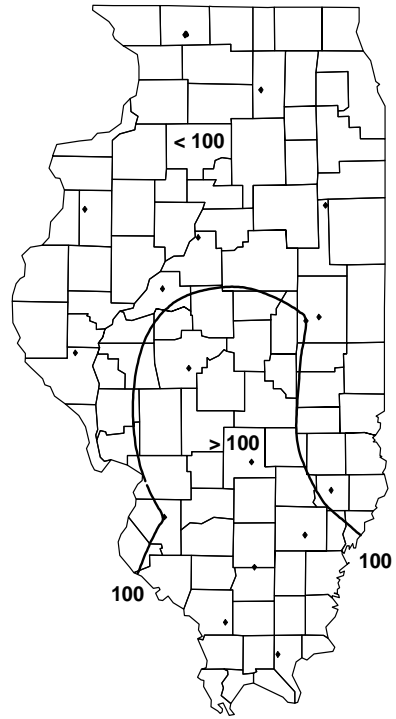


Figure 3. February monthly averages and totals as collected by the Illinois Climate Network

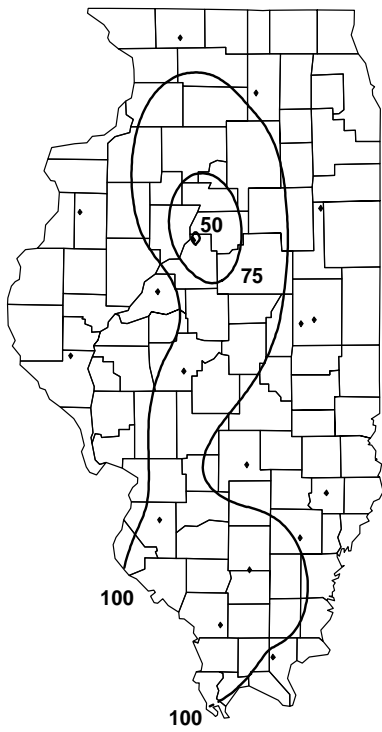
0 - 6 inch Soil Layer



6 - 20 inch Soil Layer



20 - 40 inch Soil Layer



40 - 72 inch Soil Layer

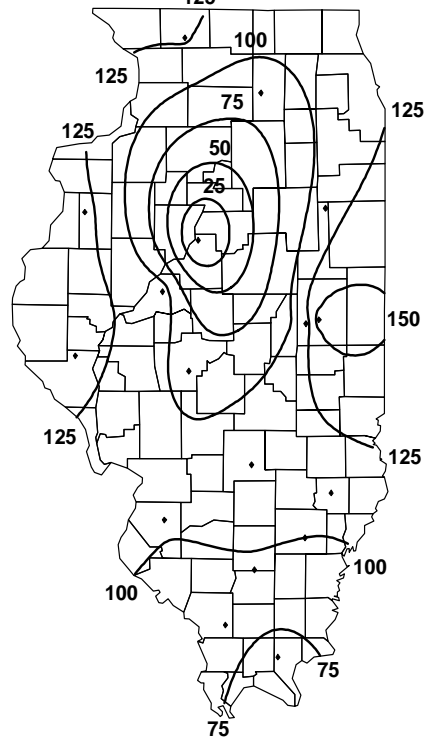


Figure 4. March 1 observed percent-of-normal soil moisture based on 1985-1995 mean

Table 2. Soil Moisture in Various Layers on March 1, 2004

<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)	2.9	23	5.1	23	6.9	7
DeKalb (NE)	2.7	11	5.3	18	7.4	20
Monmouth (W)	2.5	21	5.5	25	7.0	6
East Peoria (C)	2.5	19	5.8	18	7.0	-4
Topeka (C)	1.4	8	3.0	15	3.6	18
Stelle (E)	2.6	16	6.0	17	7.2	7
Champaign (E)	2.4	11	5.5	4	6.9	8
Bondville (E)	2.6	16	5.2	5	8.4	4
Perry (WSW)	2.4	1	5.7	4	8.3	1
Springfield (WSW)	2.1	-5	5.0	-1	7.8	2
Brownstown (ESE)	3.3	8	4.9	6	8.3	-0
Olney (ESE)	3.0	4	4.8	6	7.1	1
Belleville (SW)	2.4	3	5.3	4	8.8	1
Carbondale (SW)	2.3	-13	5.2	-3	8.0	0
Ina (SE)	2.3	4	5.0	-2	7.5	-3
Fairfield (SE)	2.6	-3	5.5	2	7.4	-2
Dixon Springs (SE)	2.3	-5	5.0	-8	8.1	0

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 (ISWS), and the 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 readings posted by the National Weather Service and/or the USACE. Stations on the Illinois River and on the Mississippi River along the Illinois border recorded peak stages below flood stage this month. The Ohio River at Cairo peaked above flood stage on February 15.

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

Mean provisional flow statewide was below the median this month (68 percent of the median) and below the mean (54 percent of the mean). Flows in northwestern Illinois were generally in the normal range this month. Flows recorded in northeastern Illinois were below normal on the Fox River and above normal on the Kankakee River. Elsewhere in the state, flows reported were in the normal to below 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, February 2004

<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	6.4	23
	La Salle	224.7	20	13.2	23
	Peoria	164.6	18	12.8	25
	Havana	119.6	14	9.0	28
	Beardstown	88.6	14	11.1	27
	Hardin	21.5	25	20.8	10
Mississippi	Dubuque	579.9	17	7.9	25
	Keokuk	364.2	16	6.7	25
	Quincy	327.9	17	12.2	26
	Grafton	218.0	18	16.0	20
	St. Louis	180.0	30	8.3	27
	Chester	109.9	27	10.0	28
	Thebes	43.7	33	14.4	29
Ohio	Cairo	2.0	40	41.3	15

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 ISWS 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 (column 6 of Table 5), while 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 levels at the end of January at 33 reservoirs, the water surface elevation had risen at 14 reservoirs, was the same as last month at 9 reservoirs, and had decreased at 10 reservoirs by the end of February. For the 33 reservoirs with observations reported at the end of February, 15 reservoirs had water surface levels above the normal pool (or target operating level), 12 reservoirs were at normal pool, and 6 reservoirs were below normal pool. Water levels at Lake Bloomington and Canton Lake remained more than 2 feet below normal pool.

Major Reservoirs. The water levels at Lake Shelbyville and Carlyle Lake have decreased since the end of January to near their seasonal target levels. Rend Lake was above its target level.

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 576.9 feet, compared to a mean level of 576.6 feet in 2003. The long-term average lake level for February is 578.5 feet, based on 1918–2002 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 576.9 feet.

Table 4. Provisional Mean Flows, February 2004

Station	Drainage area (sq mi)	Years of record	2004 mean flow (cfs)	Long-term flows		Flow condition	Percent chance of exceedence	Days of data this month
				Mean* (cfs)	Median (cfs)			
Rock River at Rockton	6363	68	3030	3900	3354	normal	60	29
Rock River near Joslin	9549	60	5692	6455	5684	normal	50	29
Pecatonica River at Freeport	1326	84	906	1125	915	normal	51	29
Green River near Geneseo	1003	64	526	765	704	normal	59	28
Edwards River near New Boston	445	65	189	373	305	normal	67	29
Kankakee River at Momence	2294	85	3716	2517	2492	above normal	17	29
Iroquois River near Chebanse	2091	79	1442	2575	2202	normal	63	28
Fox River at Dayton	2642	83	735	2078	1754	below normal	82	25
Vermilion River at Pontiac	579	59	154	522	368	normal	67	29
Spoon River at Seville	1636	86	830	1471	1346	normal	64	29
LaMoine River at Ripley	1293	79	349	1064	777	below normal	75	29
Bear Creek near Marceline	349	58	112	271	169	normal	66	29
Mackinaw River near Congerville	767	54	111	651	535	below normal	82	29
Salt Creek near Greenview	1804	61	699	1701	1352	normal	68	29
Sangamon River at Monticello	550	90	243	591	438	below normal	71	29
South Fork Sangamon near Rochester	867	53	613	905	602	normal	47	29
Illinois River at Valley City	26743	64	14,278	24,840	23,518	normal	69	28
Macoupin Creek near Kane	868	74	473	761	486	normal	50	29
Vermilion River near Danville	1290	81	567	1453	1031	normal	69	28
Kaskaskia River at Vandalia	1940	33	1824	2760	2333	normal	57	29
Shoal Creek near Breese	735	59	490	923	539	normal	56	29
Embarras River at Ste. Marie	1516	89	819	1944	1591	below normal	70	29
Skillet Fork at Wayne City	464	83	200	651	483	below normal	75	29
Little Wabash below Clay City	1131	88	695	1533	1138	normal	63	29
Big Muddy at Plumfield	794	32	275	1058	1133	below normal	82	29
Cache River at Forman	244	79	283	490	434	normal	68	29

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 2002.

Table 5. Reservoir Levels in Illinois, February 2004

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

Groundwater Information (Ken Hlinka)

Comparison to Average Levels. Shallow groundwater levels in 16 observation wells, which are remote from pumping centers, were below average levels for February by 2.6 feet and ranged from 28.4 feet below to 2.5 feet above average (Table 6). The largest deviations were in northern Illinois at Cambridge (Henry County) and Mt. Morris (Ogle County). This is the 12th consecutive month for a record monthly low at Mt. Morris, and this measurement is the lowest on record for any month at this well.

Comparison to Previous Month. Shallow groundwater levels were above those of January. Levels averaged 0.2 feet higher than those of last month and ranged from 2.4 feet below average to 2.9 feet above average.

Comparison to Same Month, Previous Year. Shallow groundwater levels in February were above levels of last year. Levels averaged 1.2 feet higher and ranged from 6.9 feet lower to 9.6 feet above levels of last year.

Table 6. Month-End Shallow Groundwater-Level Data Sites, February 2004

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	22.13	-0.55	-0.34	+0.14	-0.86
2	Mt. Morris	Ogle	55.00	33.13*	-18.58	-12.78	-0.21	-6.93
3	Crystal Lake	McHenry	18.00	6.75	-2.19	-1.44	-0.28	+0.07
4	Cambridge	Henry	42.00	37.80	-28.17	-28.42	-0.90	+3.16
5	Fermi Lab	DuPage	17.00	5.17	+0.07	+0.24	+2.63	+6.63
6	Good Hope	McDonough	30.00	5.53	+1.88	+1.63	-0.25	+5.69
7	Snicarte	Mason	42.00	38.97	-1.69	-1.66	-0.24	-0.84
8	Coffman	Pike	28.00	9.90	-1.06	+1.15	-2.37	+4.16
9	Greenfield	Greene	20.70	6.74	+2.28	+2.53	+2.93	+9.61
10	Janesville	Cumberland	11.00	5.03	-0.56	-0.43	0.00	+0.32
11	St. Peter	Fayette	15.00	1.07	+0.35	+0.62	+0.93	+0.16
12	SWS #2	St. Clair	80.00	N/A	N/A	N/A	N/A	N/A
13	Boyleston	Wayne	23.00	1.92	-0.10	+0.18	+0.60	-0.64
14	Sparta	Randolph	27.00	6.41	-1.17	-0.32	+1.53	+1.06
15	SE College	Saline	10.19	2.63	-1.14	-1.19	-0.10	-2.19
16	Dixon Springs	Pope	8.63	2.31	-0.51	-0.62	-0.79	-1.17
17	Bondville	Champaign	21.00	3.32	-0.55	-0.51	-0.52	+1.39
Averages					-3.23	-2.59	+0.19	+1.23

Notes:

N/A = Data not available.

*Lowest level of record for February.

Addendum

Long-Term Precipitation Networks (Nancy Westcott)

Imperial Valley Precipitation. February 2004 precipitation amounts (Figure 5a) were very light. Network gage amounts were greatest in southwestern and eastern portions of the network and lightest in the northeastern portion of the network. Individual gage totals ranged from 0.44 inches at sites #12 and #18 to 0.20 inches at site #3. 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 2004 network average of 0.33 inches is about 18 percent of the 11-year (1992–2002) network average of 1.79 inches.

Cook County Precipitation. February 2004 precipitation amounts also were below average. Precipitation was greatest in the northeastern quadrant of the network, and lightest in the southern portion of the network (Figure 5b). Precipitation values ranged from 0.89 inches at site #2 (Winnetka) to 0.31 inches at site #20 (Orland Park). The February 2004 network average of 0.56 inches is about 32 percent of the 14-year (1990–2003) February network average of 1.76 inches.

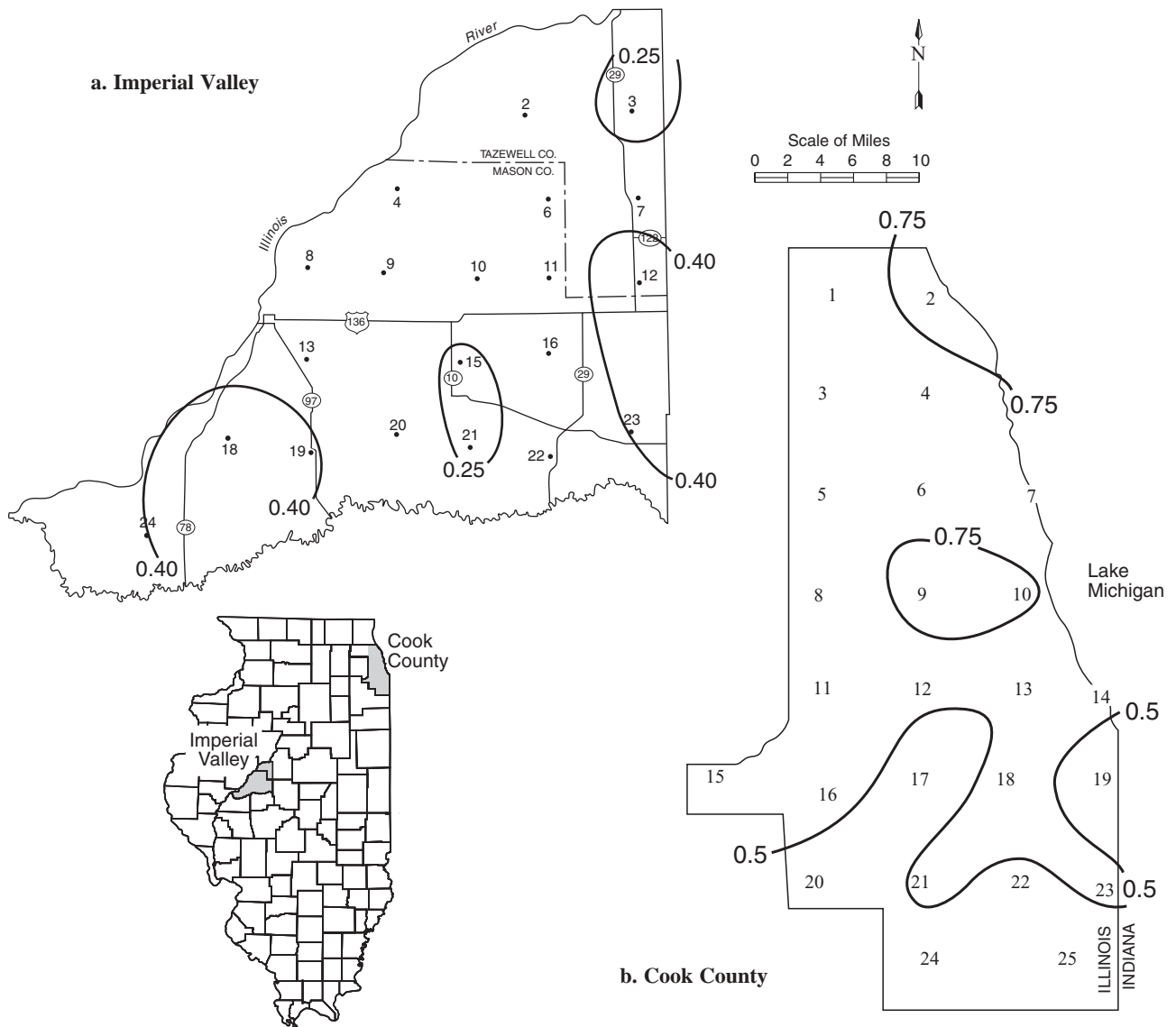


Figure 5. Long-term raingage network precipitation totals (inches) for February 2004

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/>

Equal opportunity to participate in programs of the Illinois Department of Natural Resources (IDNR) and those funded by the U.S. Fish and Wildlife Service and other agencies is available to all individuals regardless of race, sex, national origin, disability, age, religion, or other non-merit factors. If you believe you have been discriminated against, contact the funding source's civil rights office and/or the Equal Employment Opportunity Officer, IDNR, One Natural Resources Way, Springfield, IL 62702-1271; 217/785-0067; TTY 217/782-9175.