

ILLINOIS WATER AND CLIMATE SUMMARY

April 2006

April 2006 Overview (Bob Scott)

Temperatures in Illinois during April were well above average, the 9th warmest April since 1895. Precipitation was near average. Soil moisture within the top 40 inches of soil was slightly below the long-term statewide average. Mean streamflows statewide were just above median heights. Shallow groundwater levels continued below long-term average depths.

Temperatures across Illinois (Figure 1) for April were well above average (a +4.5-degree departure). Crop Reporting Districts (CRD) temperatures ranged from 4.0 degrees above average (east) to 5.4 degrees above average (southwest).

Precipitation amounts for Illinois in April were near average (Figure 1). The statewide average of 4.07 inches represents a +0.27-inch departure or 107 percent of average. The central and east CRDs each recorded the greatest regional rainfall total, 5.20 inches (145 and 147 percent of average, respectively), while the west-southwest CRD recorded 2.83 inches (74 percent of average) and the southeast CRD recorded 3.10 inches (70 percent of average).

Soil moisture in the 0- to 40-inch (0- to 100-centimeter) layer at the end of April was below normal to slightly above normal across Illinois.

Mean provisional streamflow statewide was above the median flow in April, 112 percent of median (Figure 1). Rivers in Illinois recorded monthly mean discharges in the below normal to above normal range. The Illinois River reached flood stage at La Salle in April.

Water surface levels at the end of April were below the normal pool/target operating level at 11 of 33 reporting reservoirs. Lake Shelbyville and Carlyle Lake were within target operational levels, and Rend Lake was 3.5 feet above its target level. Lake Michigan's mean level remains below the long-term average.

Statewide, **shallow groundwater levels** continue to be below normal. Deviations from normal averaged 2.1 feet below normal. Levels averaged 0.6 feet lower than March levels and approximately 1.9 feet below April levels last year.

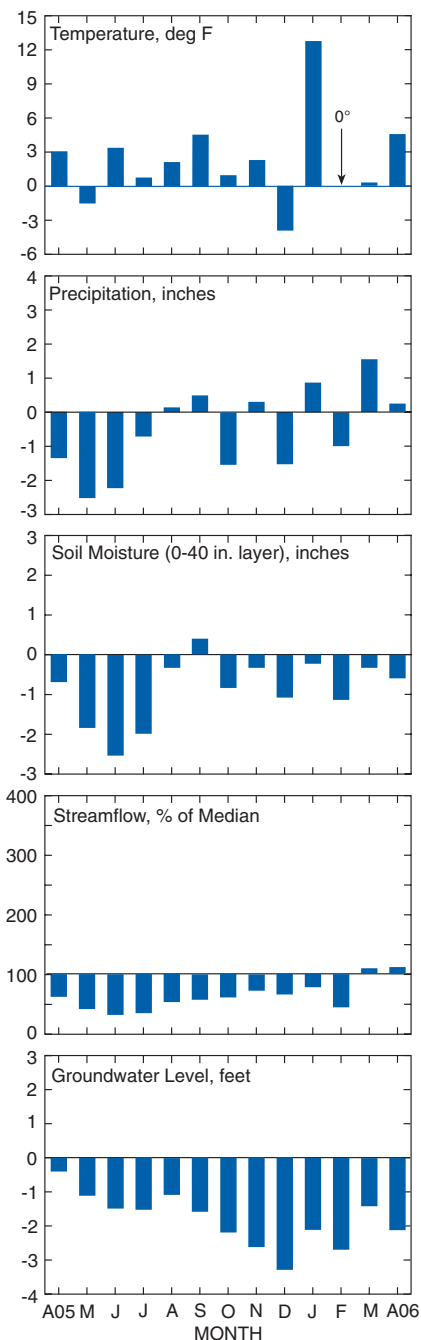


Figure 1.
Statewide departures from normal

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 April were well above normal (Figure 2 and Table 1). Extremes ranged from 92°F on April 16 at Hutsonville to 21°F on April 9 at Mt. Carroll. Statewide, it was the 9th warmest April, 15th warmest February–April, 5th warmest November–April, and 2nd warmest May–April since 1895. Regionally, the past 12 months were the warmest on record for the northwest and northeast CRDs.

Precipitation for April was near normal statewide (Figure 2 and Table 1). Chicago Heights reported the highest one-day precipitation, 5.03 inches on April 17. Riverton reported the highest monthly total, 7.85 inches.

Severe weather was widely reported in April, including two significant tornado outbreaks with 52 reported tornadoes, although some have yet to be confirmed by the National Weather Service. There were reports of 27 tornadoes on April 2. Hardest hit was the Taylorville area with one injury and considerable damage, but hail and wind damage were reported throughout Illinois. No damage or injuries were reported from a tornado near Lincoln on April 13. There also were widespread reports of hail and wind damage throughout central and northern Illinois. Other damage during the month included cracked windshields from 2.5-inch hail in Iroquois County on April 14, considerable damage but no injuries from 23 tornado reports in central Illinois on April 16, and no damage or injuries from a tornado reported near Lincoln on April 18.

Illinois Climate Network (ICN) Data. Average daily wind speeds across Illinois for April (Figure 3) ranged from 4.6 mph at Dixon Springs to 12.7 mph at Monmouth and Stelle. Bondville recorded the highest gust during the month (66 mph on April 2). The prevailing wind direction was easterly in northeastern Illinois and southerly to southwesterly across southern Illinois. Wind speeds in excess of 8 mph varied from 99 hours at Dixon Springs to 560 hours at Monmouth. (April has 720 hours.) Average air temperatures ranged from the lower 50s in northern Illinois to the lower 60s in southern Illinois.

Solar radiation totals in March varied from 515 Mega-Joules per meter squared (MJ/m²) at St. Charles to 603 MJ/m² at Perry and Kilbourne. Potential evapotranspiration varied from a low of 4.0 inches at St. Charles to nearly 4.9 inches at Belleville and Perry. Soil temperatures at the 4- and 8-inch levels ranged from the low 50s in northern Illinois to the low to middle 60s in far southern Illinois.

Extended climate outlooks issued by the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Climate Prediction Center for May call for a slight chance of above normal precipitation in far southern Illinois. May temperature outlooks and May–July temperature and precipitation outlooks call for equal chances of above, below, and normal conditions across the state.

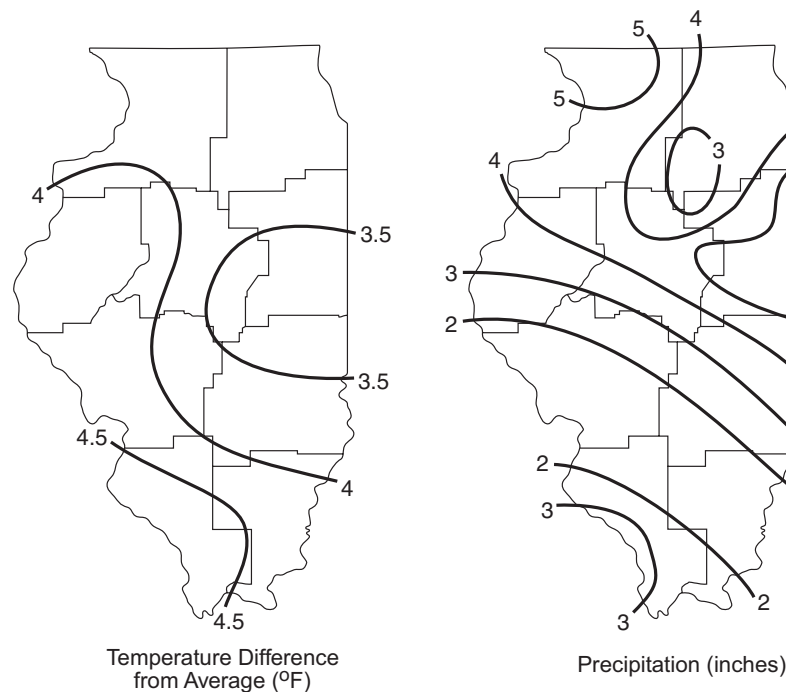


Figure 2. Illinois temperature and precipitation during April 2006

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>		
	Apr 06 Amount	% Avg	Temp Dev	Feb 06- Apr 06	% Avg	Temp Dev	Nov 05- Apr 06	% Avg	Temp Dev	May 05- Apr 06	% Avg	Temp Dev
Northwest	5.08	144	4.1	9.58	127	1.7	15.83	117	2.9	28.62	79	2.4
Northeast	3.86	105	4.4	8.15	105	1.9	14.85	102	2.8	27.53	75	2.4
West	3.88	106	4.8	8.17	100	1.9	13.95	95	3.1	28.60	76	2.4
Central	5.20	145	4.4	9.06	109	1.9	15.80	103	2.9	28.69	77	2.4
East	5.20	147	4.0	9.42	114	1.8	15.91	101	2.6	33.53	89	2.0
West-southwest	2.83	74	4.5	7.17	79	1.8	13.56	80	2.8	28.06	74	2.1
East-southeast	4.21	106	4.2	11.31	114	1.4	19.45	101	2.5	37.04	90	1.9
Southwest	3.08	73	5.4	11.48	107	1.7	20.37	97	2.9	39.70	93	2.0
Southeast	3.10	70	5.0	13.20	113	1.8	23.64	104	2.8	44.45	100	2.1
State Average	4.07	107	4.5	9.59	107	1.8	16.80	100	2.8	32.42	84	2.2

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

Soil Moisture Information (Bob Scott)

Precipitation totals in Illinois during April were above average in northwestern, central, and east-central Illinois, and below average in southwestern and southern Illinois. Soil moisture near the surface was near normal across most of the state, but soils in southwestern areas were drier (Figure 4). Values in the 0- to 6-inch layer ranged from 44 percent of normal at Belleville to 130 percent at Monmouth. Conditions in the 6- to 20-inch layer were more moderate, ranging from 56 percent at Springfield to 118 percent at Dixon Springs. Deeper layers were slightly wetter with values in the 20- to 40-inch layer varying from 57 percent at Bondville to 140 percent at Peoria. Values were similar in the 40- to 72-inch layer and varied from 62 percent at DeKalb to 143 percent at Rend Lake. Overall, soil moisture in Illinois at the end of April was slightly below normal (Figure 1).

Compared to conditions at the end of March, soil moisture in April decreased across most of Illinois (Table 2). Moderate decreases of 10 to 40 percent were common in the 0- to 6-inch layer, with Belleville and Topeka each reporting the largest decreases (approximately 47 percent), but small increases were observed in northern and far southern Illinois. Decreases in soil moisture also dominated the 6- to 20-inch layer, generally ranging from 10 to 20 percent at most sites, but changes at about a third of the sites were under 10 percent. Differences from last month in the 20- to 40-inch layer were under 10 percent at all sites, except for an 18-percent decrease at Topeka.

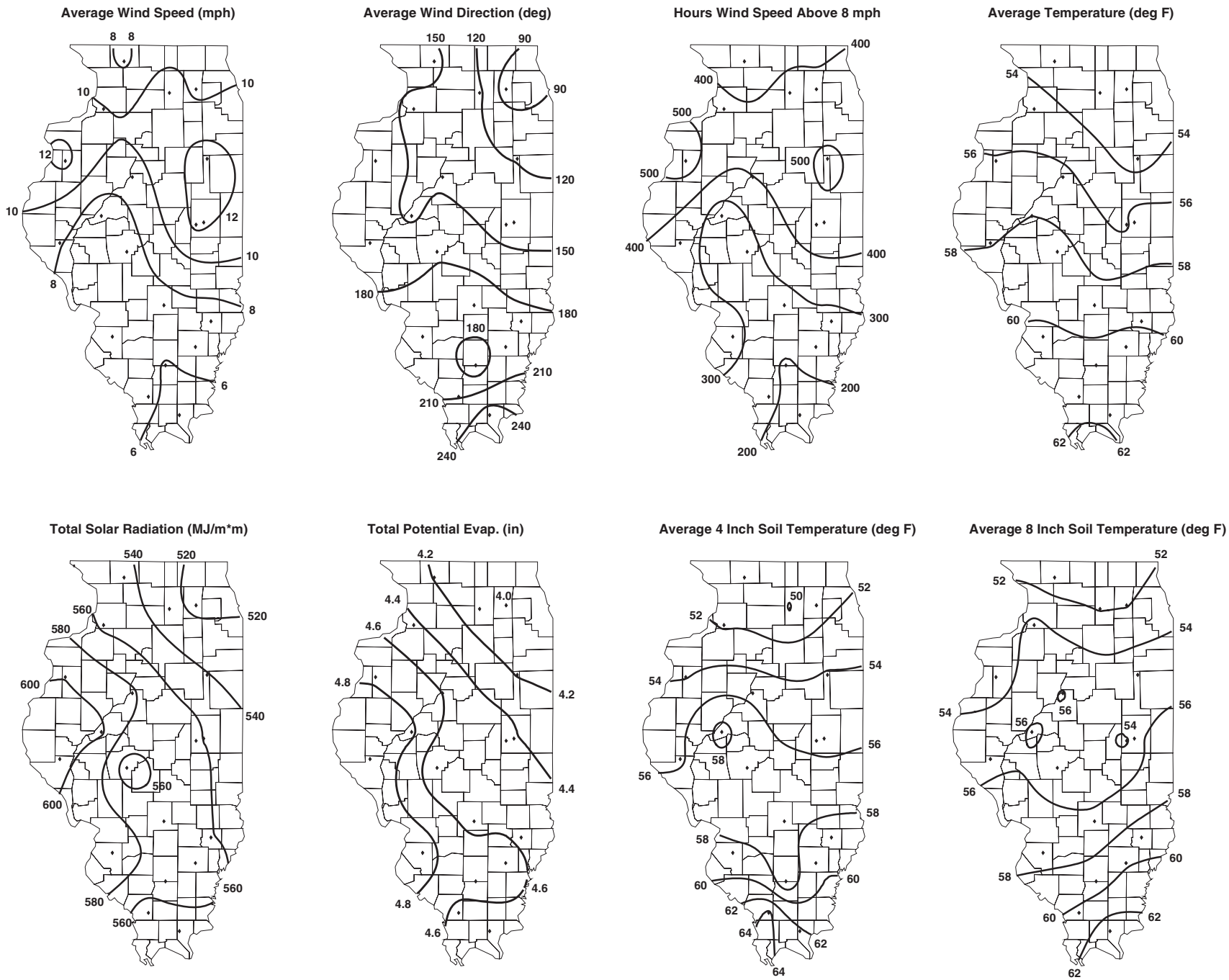


Figure 3. April monthly averages and totals as collected by the Illinois Climate Network

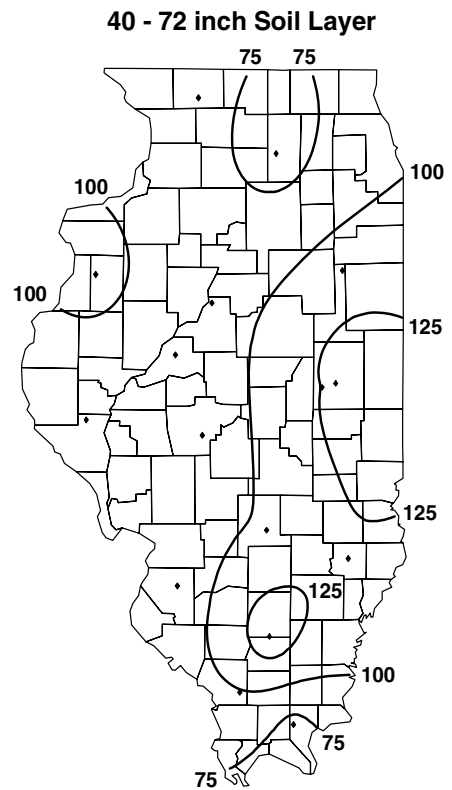
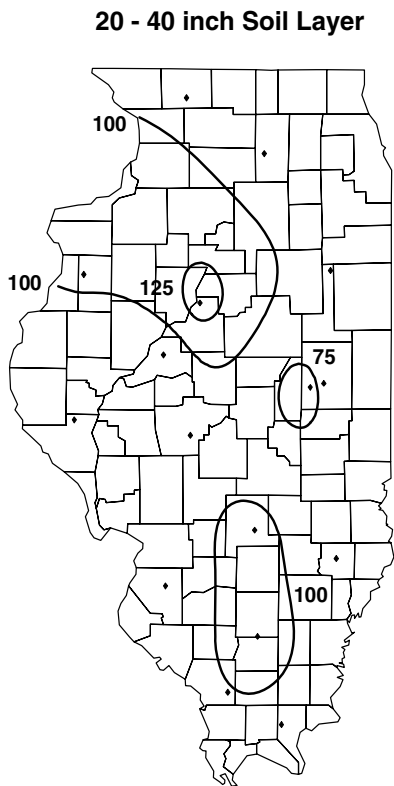
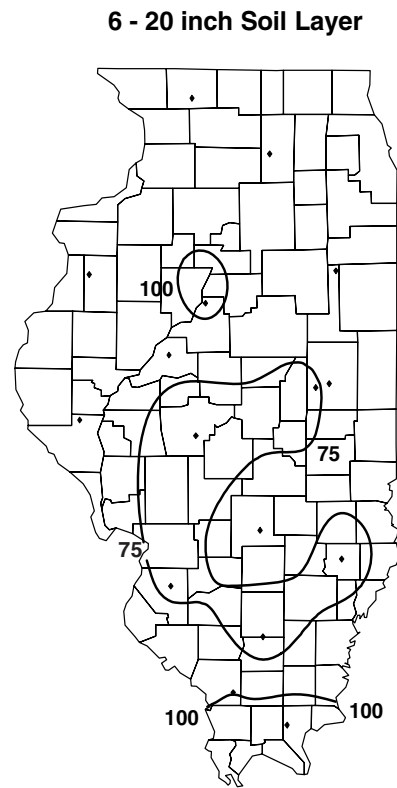
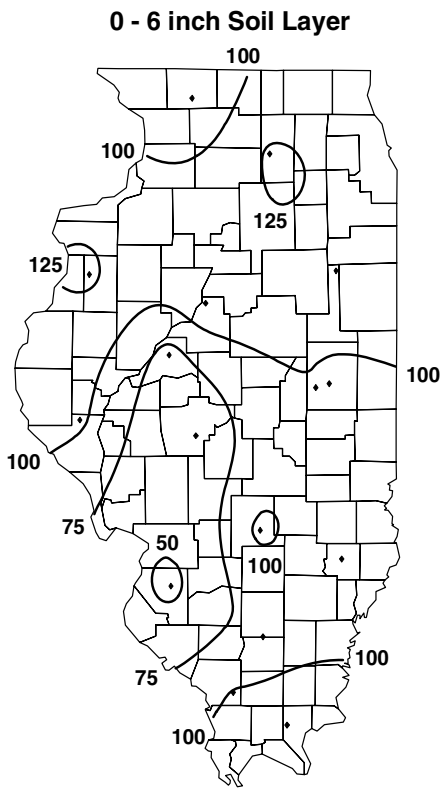


Figure 4. May 1 observed percent-of-normal soil moisture based on 1985-1995 mean

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

<i>Location</i>	<i>May 1 0 - 6 (inches)</i>	<i>Change from Apr 1 (%)</i>	<i>May 1 6 - 20 (inches)</i>	<i>Change from Apr 1 (%)</i>	<i>May 1 20 - 40 (inches)</i>	<i>Change from Apr 1 (%)</i>
Freeport (NW)	1.4	-29	4.0	-11	6.9	-1
DeKalb (NE)	2.3	7	4.2	-6	6.8	7
Monmouth (W)	2.2	6	4.0	-16	6.7	-4
East Peoria (C)	2.0	-11	4.8	-3	7.9	2
Topeka (C)	0.7	-46	2.2	-18	2.8	-18
Stelle (E)	2.2	7	4.9	-3	7.0	1
Champaign (E)	1.9	-5	4.8	-1	6.5	1
Bondville (E)	2.0	-19	4.1	-6	6.7	2
Perry (WSW)	1.9	-17	4.6	-14	7.7	0
Springfield (WSW)	1.4	-37	4.4	-12	7.9	-2
Brownstown (ESE)	2.2	-20	4.2	-14	8.2	-1
Olney (ESE)	2.0	-20	4.6	-3	7.2	2
Belleville (SW)	1.1	-47	3.5	-31	7.7	-8
Carbondale (SW)	2.2	-11	4.6	-14	7.7	-5
Ina (SE)	1.9	-27	4.4	-19	7.6	-2
Fairfield (SE)	1.8	-29	4.8	-13	7.5	1
Dixon Springs (SE)	2.8	7	5.6	3	8.0	0

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 the provisional peak stage for the current month compared to flood stage at selected streamgaging stations located on the Illinois, Mississippi, and Ohio Rivers. 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 April, except on the Illinois River at La Salle, which just reached flood stage.

Provisional monthly mean flows for 26 streamgaging stations located throughout Illinois are shown in Table 4. Mean values 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. 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 April 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 slightly above the median this month (112 percent of the median) and slightly below the long-term mean (93 percent of the mean). Mean streamflow conditions for the month ranged from

Table 3. Peak Stages for Major Rivers during April 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	16	12.9	18
	La Salle	224.7	20	20.0	19
	Peoria	164.6	18	14.6	22
	Havana	119.6	14	13.2	23
	Beardstown	88.6	14	12.7	25
	Hardin	21.5	25	22.0	25
Mississippi	Dubuque	579.9	17	15.2	18
	Keokuk	364.2	16	11.9	17
	Quincy	327.9	17	14.7	18
	Grafton	218.0	18	16.4	25
	St. Louis	180.0	30	16.0	21
	Chester	109.9	27	18.1	10
	Thebes	43.7	33	22.5	22
Ohio	Cairo	2.0	40	33.1	25

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.

below normal to above normal.

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-March levels at 31 reservoirs, by the end of April, the water surface elevation had increased at 11 reservoirs, had decreased at 14 reservoirs, and was the same as last month at 6 reservoirs. For the 33 reservoirs with observations reported at the end of April, 10 reservoirs were above normal pool (or target operating level), 12 reservoirs were at normal pool or spillway elevation, and 11 reservoirs were below normal pool.

Major Reservoirs. Compared to water levels at the end of March, by the end of April the water levels at Carlyle Lake had increased slightly, Rend Lake decreased 1.3 feet, and Lake Shelbyville decreased 0.7 ft. At the end of April, the water surface level at Rend Lake was about 3.5 feet above target level. Lake Shelbyville was 2.7 feet below the May 1 target level, and Carlyle Lake was 0.9 feet below the May 1 target level; however, the level at each lake was between April and May seasonal operating targets.

Great Lakes. Current month mean and end-of-month values are provisional and are relative to International Great Lakes Datum 1985. The April mean level for Lake Michigan was 577.5 feet, compared to a mean level of 577.9 feet in April 2005. The long-term average lake level for April is 578.8 feet, based on 1918–2005 data. Historically, the lowest mean level for Lake Michigan in April occurred in 1964 at 576.1 feet, and the highest level occurred in 1986 at 581.5 feet. The month-end level of Lake Michigan was 577.6 feet.

Table 4. Provisional Mean Flows, April 2006

<i>Station</i>	<i>Drainage area (sq mi)</i>	<i>Years of record</i>	<i>2006 mean flow (cfs)</i>	<i>Long-term flows</i>		<i>Flow condition</i>	<i>Percent chance of exceedence</i>	<i>Days of data this month</i>
				<i>Mean*</i>	<i>Median</i>			
				<i>(cfs)</i>	<i>(cfs)</i>			
Rock River at Rockton	6363	70	6879	7279	6711	normal	46	30
Rock River near Joslin	9549	62	9436	10,700	9587	normal	49	30
Pecatonica River at Freeport	1326	86	1188	1215	1010	normal	37	30
Green River near Geneseo	1003	67	479	1058	960	below normal	82	30
Edwards River near New Boston	445	67	356	543	401	normal	54	30
Kankakee River at Momence	2294	88	2106	3461	3489	below normal	75	30
Iroquois River near Chebanse	2091	81	3542	3182	3037	normal	40	30
Fox River at Dayton	2642	86	2452	3249	2758	normal	59	30
Vermilion River at Pontiac	579	61	1117	798	673	above normal	21	30
Spoon River at Seville	1636	88	1336	1835	1530	normal	53	30
LaMoine River at Ripley	1293	82	963	1555	1215	normal	58	30
Bear Creek near Marceline	349	61	130	412	317	below normal	71	30
Mackinaw River near Congerville	767	56	946	1043	938	normal	49	30
Salt Creek near Greenview	1804	63	2556	2402	1928	normal	36	30
Sangamon River at Monticello	550	93	805	802	679	normal	38	30
South Fork Sangamon near Rochester	867	55	933	1046	759	normal	41	30
Illinois River at Valley City	26,743	66	28,980	36,950	33,610	normal	60	30
Macoupin Creek near Kane	868	76	274	1139	582	normal	66	30
Vermilion River near Danville	1290	83	2950	1840	1563	above normal	18	30
Kaskaskia River at Vandalia	1940	35	3469	2446	1921	normal	31	30
Shoal Creek near Breese	735	61	466	961	633	normal	58	30
Embarras River at Ste. Marie	1516	91	3680	2171	1647	above normal	16	30
Skillet Fork at Wayne City	464	85	466	774	638	normal	55	30
Little Wabash below Clay City	1131	90	1616	1624	1102	normal	38	30
Big Muddy at Plumfield	794	34	1042	1451	1236	normal	51	30
Cache River at Forman	244	81	215	561	505	below normal	76	30

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, April 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 16 observation wells, which are remote from pumping centers, were below average levels for the 13th consecutive month. April levels were 2.1 feet below normal and ranged from 9.4 feet below normal to 1.7 feet above normal (Table 6). The Greenfield well (Greene County) is currently at a record low for April.

Comparison to Previous Month. Shallow groundwater levels were below March levels. Levels averaged 0.6 feet lower and ranged from 2.5 feet below to 2.0 feet above levels last month.

Comparison to Same Month, Previous Year. Shallow groundwater levels in April were below levels one year ago. Levels averaged 1.9 feet lower and ranged from 8.7 feet lower to 1.1 feet above last April's levels.

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

Number	Well name	County	Well depth (feet)	This month's reading (depth to water, feet)	15-year avg. level (feet)	Deviation from		
						Period of record avg. (feet)	Previous month (feet)	Previous year (feet)
1	Galena	JoDaviess	25.00	21.67	-0.94	-0.61	+0.69	-0.15
2	Mt. Morris	Ogle	55.00	27.05	-9.10	-8.92	+1.96	-4.76
3	Crystal Lake	McHenry	18.00	5.93	-1.92	-1.82	+0.72	-2.57
4	Cambridge	Henry	42.00	39.46*	N/A	N/A	N/A	N/A
5	Fermi Lab	DuPage	17.00	5.69	-0.74	-0.74	-0.49	+1.14
6	Good Hope	McDonough	30.00	3.88	+1.17	+1.71	-1.21	-0.29
7	Snicarte	Mason	40.30	39.48	-2.90	-2.85	+0.34	-4.31
8	Coffman	Pike	28.00	14.81	-6.94	-6.50	-2.18	-5.18
9	Greenfield	Greene	20.70	16.68**	-8.98	-9.39	+1.05	-8.65
10	Janesville	Cumberland	11.00	4.56	-0.03	+0.05	-0.28	+1.06
11	St. Peter	Fayette	15.00	2.94	-0.86	-0.70	-1.96	-1.22
12	SWS #2	St. Clair	80.00	13.83	-1.56	-0.22	-1.20	N/A
13	Boyleston	Wayne	23.00	3.33	-0.75	-0.49	-1.25	-1.15
14	Sparta	Randolph	27.00	5.47	-1.48	-0.66	-1.42	-1.26
15	SE College	Saline	10.19	4.47	-1.89	-1.99	-2.54	-1.17
16	Dixon Springs	Pope	8.63	3.72	-1.30	-1.97	-1.71	-0.35
17	Bondville	Champaign	21.00	1.81	+0.77	+0.90	+0.14	+0.77
Averages					-2.34	-2.14	-0.58	-1.87

Notes:

N/A = Data not available.

*Well not used for analyses.

**Well currently at record monthly low.

Addendum

Imperial Valley Precipitation. April 2006 precipitation amounts (Figure 5a) were above average. Gage totals were highest in the southwestern portion of the network, and lowest in the northwestern region of the network. Individual gage amounts ranged from 5.31 inches at site #18 to 3.14 inches at site #4. The 30-year (1971–2000) average precipitation amounts for April at Havana and Mason City were 3.45 and 3.34 inches, respectively. The April 2006 network average of 4.34 inches was about 128 percent of the 13-year (1993–2005) April network average of 3.40 inches.

Cook County Precipitation. April 2006 precipitation amounts (Figure 5b) were moderate, but a particularly heavy storm event occurred on April 16–17, 2006. Precipitation was heaviest in the far southern portion of the network and lightest in the northern region of the network. Precipitation values ranged from 7.58 inches at site #24 (Matteson) to 2.93 inches at site #3 (Des Plaines). The April 2006 network average of 4.10 inches was about 121 percent of the 16-year (1990–2005) April network average of 3.39 inches.

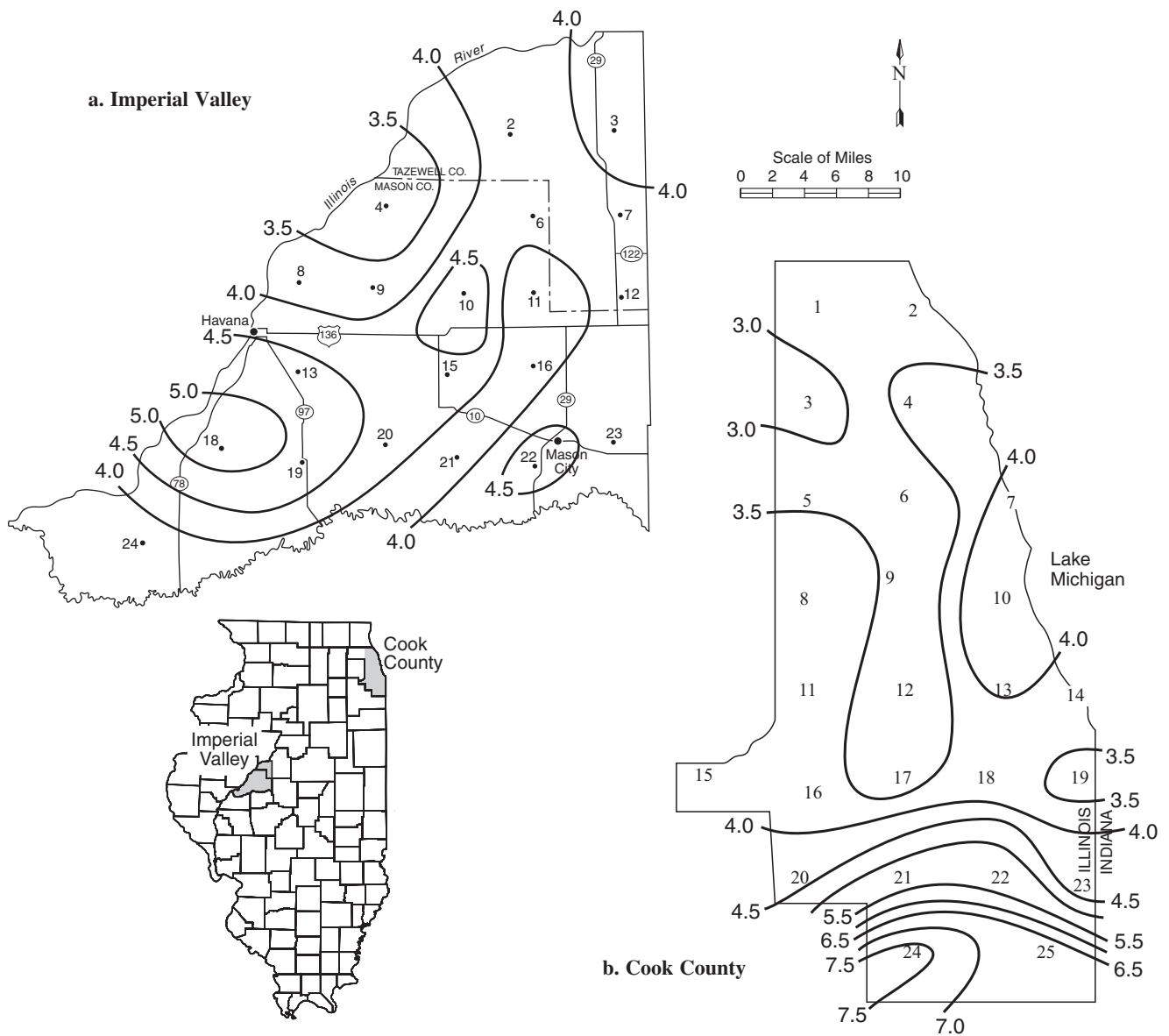


Figure 5. Long-term raingage network precipitation totals (inches) for April 2006

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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