

ILLINOIS WATER AND CLIMATE SUMMARY  
March 2006

March 2006 Overview (Bob Scott)

Temperatures in Illinois during March were near average for the month, while precipitation was well above average. Soil moisture within the top 40 inches of soil was slightly below the long-term statewide average. Mean streamflows statewide were above median heights, the first above-median monthly flow since February 2005. Shallow groundwater levels continued below long-term average depths for the 12th consecutive month.

**Temperatures** across Illinois (Figure 1) for March were near average (a +0.3-degree departure). By Crop Reporting Districts (CRD), temperatures ranged from 0.9 degrees above average (southwest) to -0.2 degrees below average (east-southeast).

**Precipitation** amounts for Illinois in March were well above average (Figure 1). The statewide average of 4.79 inches represented a +1.57-inch departure or 149 percent of average. The southeast CRD recorded the greatest regional rainfall total in March with 8.56 inches (197 percent of average), while the northeast CRD received the least amount of rainfall, 3.29 inches (130 percent of average). After the very dry conditions that have occurred in Illinois over the past year, this was the 16th wettest March statewide and the 8th wettest March in the southeast CDRs since 1895.

**Soil moisture** in the 0- to 40-inch (0- to 100-centimeter) layer at the end of March was close to normal across much of Illinois. Nevertheless, dry soils in north-central Illinois continued in deeper layers.

**Mean provisional streamflow** statewide was above the median flow in March, 110 percent of median (Figure 1). Rivers in Illinois recorded monthly mean discharges in the much below normal to much above normal range this month. Peaks on major rivers did not exceed flood stage in March.

**Water surface levels** at the end of March were below the normal pool/target operating level at 11 of 33 reporting reservoirs. Lake Shelbyville and Rend Lake were well above target operational level, and Carlyle Lake was approaching target operational level for the spring season. Lake Michigan's mean level remains below the long-term average.

Statewide, **shallow groundwater levels** continue to be below normal by an average of 1.4 feet in March. Levels averaged 1.7 feet higher than February levels, and were approximately 2.2 feet below March levels one year ago.

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

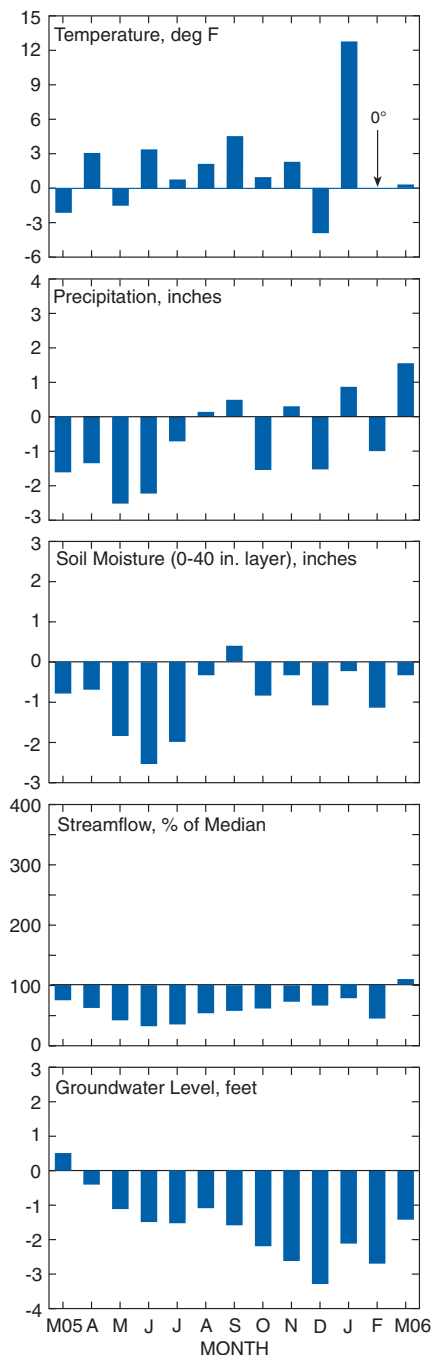


Figure 1. Statewide departures from normal

Contact

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For more information, see [www.sws.uiuc.edu/warm](http://www.sws.uiuc.edu/warm)

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

**Temperatures** across Illinois for March were slightly above normal (Figure 2 and Table 1). The warmest reading for the month, 82 degrees, was reported on March 31 at Belleville. The coldest reading, 9 degrees, was observed on March 4 at Mt. Carroll. This was the 9th warmest January-March (3-month period), the 16th warmest October-March (6-month period), and 6th warmest April-March (12-month period) since 1895.

**Precipitation** for March was well above normal statewide (Figure 2 and Table 1). Grayville reported the highest 1-day precipitation amount of 4.25 inches on March 12 and the highest monthly total of 10.74 inches. This was the 16th wettest March, but the 10th driest April-March (12-month period) since 1895. A mid-March snowstorm dropped significant snowfall amounts across central Illinois. Winchester received the most of any Illinois site in that storm, 10.6 inches.

**Severe weather** was reported in Illinois on March 10-12, including two tornado outbreaks. On March 10, hail was reported in several counties in southern Illinois. On March 11, severe weather was reported statewide. This included five tornado reports in southern Illinois: 1 in Monroe County, 2 in Randolph County, and 2 in Perry County. The tornado near Cutler (Perry County) destroyed one home with two minor injuries. Six other homes sustained damage. On March 12, severe weather continued across Illinois, especially in central and northern Illinois. This episode yielded 13 more reports of tornadoes as a thunderstorm supercell tracked across central Illinois. Two tornadoes were reported in Greene County; 1 in Scott County; 2 in Morgan County; 5 in Sangamon County; 2 in Logan County; and 1 in DeWitt County. Considerable damage and a number of injuries (23) were reported in Sangamon County.

**Illinois Climate Network (ICN) Data.** Average daily wind speeds across Illinois for March (Figure 3) ranged from 6 mph at Dixon Springs to 12 mph at Bondville and Stelle. Highest gusts during the month were recorded at Bondville and Stelle (53 mph on March 31). The prevailing wind direction was complex during March, being southeasterly to southwesterly in west-central to southern Illinois and northeasterly to northwesterly across northern Illinois. Wind speeds in excess of 8 mph varied from 166 hours at Dixon Springs to approximately 517 hours at Bondville, Monmouth, and Stelle. (March has 744 hours.) Average air temperatures in March showed a strong seasonal increase from February, ranging from the middle 30s in northern Illinois to the upper 40s in southern Illinois.

Solar radiation totals in March varied from about 350 Mega-Joules per meter squared ( $\text{MJ}/\text{m}^2$ ) at St. Charles and Big Bend to 434  $\text{MJ}/\text{m}^2$  at Belleville. Potential evapotranspiration observations varied from a low of 2.1 inches across northern Illinois to nearly 3.0 inches at Belleville. Soil temperatures at the 4- and 8-inch levels ranged from the middle 30s in northwestern Illinois to 50° F in far southern Illinois.

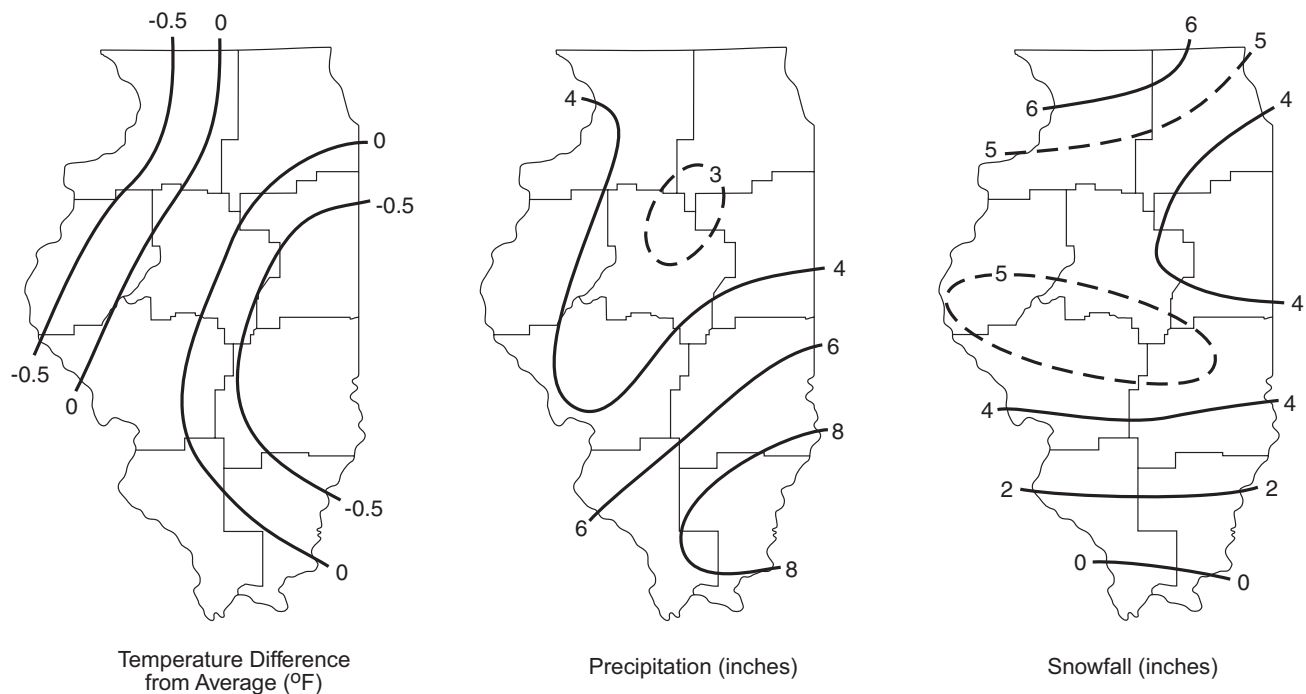


Figure 2. Illinois temperature, precipitation, and snowfall during March 2006

**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		
	Mar 06 Amount	% Avg	Temp Dev	Jan 06- Mar 06	% Avg	Temp Dev	Oct 05- Mar 06	% Avg	Temp Dev	Apr 05- Mar 06	% Avg	Temp Dev
Northwest	3.94	156	0.0	7.33	136	5.0	11.56	90	2.4	25.38	70	2.4
Northeast	3.29	130	0.3	7.31	128	5.0	11.90	87	2.3	25.67	70	2.4
West	4.22	147	0.3	7.18	121	4.8	12.25	87	2.4	28.29	76	2.3
Central	3.34	112	0.4	6.69	106	5.1	12.13	83	2.4	25.89	70	2.3
East	3.45	113	0.1	6.66	102	5.0	12.72	85	2.0	31.03	83	1.9
West-southwest	3.97	120	0.3	6.53	92	4.5	12.66	79	2.1	27.40	73	2.0
East-southeast	6.19	170	-0.2	9.90	120	4.1	16.91	93	1.8	35.62	87	1.7
Southwest	7.32	182	0.9	11.64	128	3.9	18.80	95	2.0	40.06	94	1.7
Southeast	8.56	197	0.7	14.38	140	3.9	21.86	103	2.0	44.70	101	1.8
<b>State Average</b>	<b>4.79</b>	<b>149</b>	<b>0.3</b>	<b>8.41</b>	<b>119</b>	<b>4.6</b>	<b>14.25</b>	<b>89</b>	<b>2.2</b>	<b>30.97</b>	<b>80</b>	<b>2.1</b>

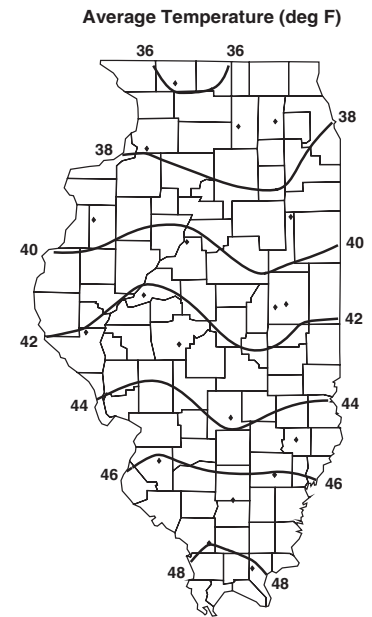
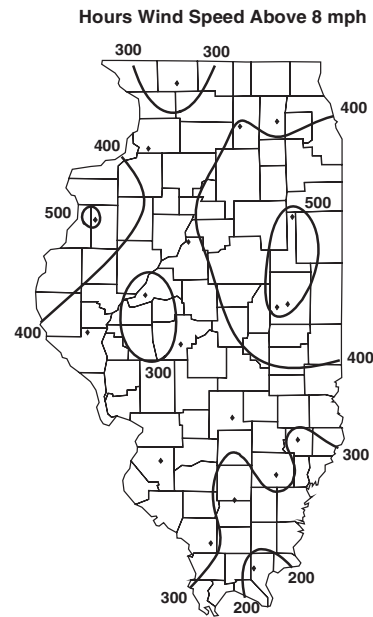
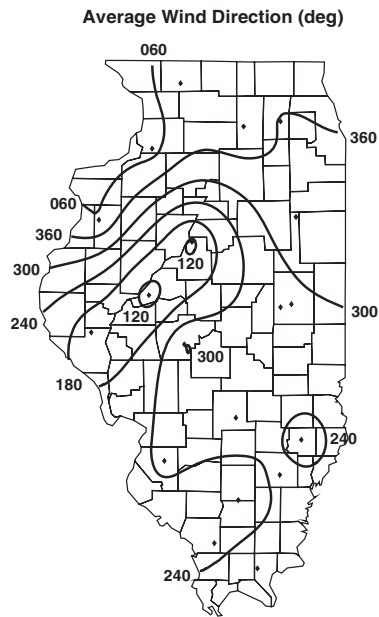
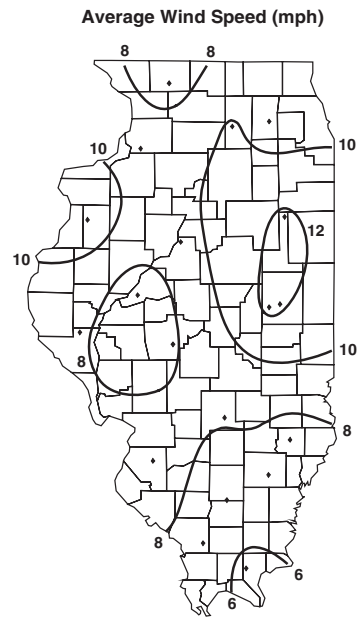
**Note:** Data are provisional. Complete, quality-controlled data are available about six months after a given month.

**Extended climate outlooks** issued by the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Climate Prediction Center for April call for above normal temperatures in southern Illinois and a slight chance of above normal precipitation in northern Illinois. Elsewhere in Illinois during April, and in the outlook for April through June, conditions 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 March were well above average across the state. This resulted in soil moisture conditions near the surface that were near normal across much of Illinois (Figure 4). Values in the 0- to 6-inch layer ranged from 73 percent of normal at Stelle to 140 percent at Topeka. Similarly, values in the 6- to 20-inch layer ranged from 63 percent at DeKalb to 111 percent at Olney and Rend Lake. Patterns were less moist 40 to 72 inches deep, varying from 54 to 116 percent at DeKalb and Rend Lake, respectively. A dry band of soils remained over north-central Illinois in the deepest layer, but the magnitude and breadth of the dryness decreased. Site values in this layer ranged from 28 percent at Peoria to 148 percent of normal at Rend Lake. Overall, soil moisture in Illinois at the end of March was slightly below normal (Figure 1).

Compared to conditions at the end of February, soil moisture in March increased across most of Illinois (Table 2). Moderate increases of 10 to 30 percent were widespread in the 0- to 6-inch layer with Stelle reporting the largest increase (28 percent). In the 6- to 20-inch layer, most sites reported small increases, maximizing near 10 percent at Monmouth, Stelle, and Belleville. Conversely, Bondville observed the only substantial decrease in moisture (14 percent). Small increases (generally 10 percent or less) dominated soil moisture values in the 20- to 40-inch layer with a 16 percent increase at Topeka as the largest change. Bondville again showed an opposite measurement, a drying of 13 percent.



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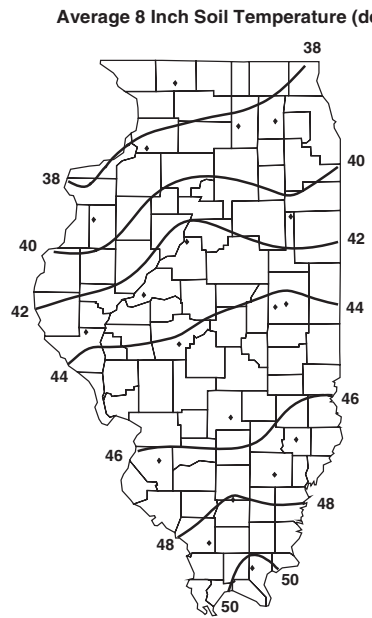
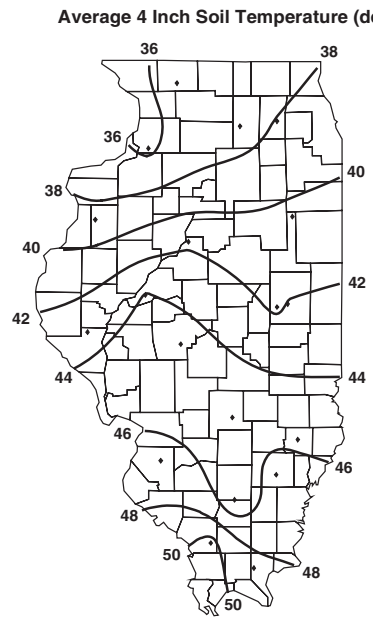
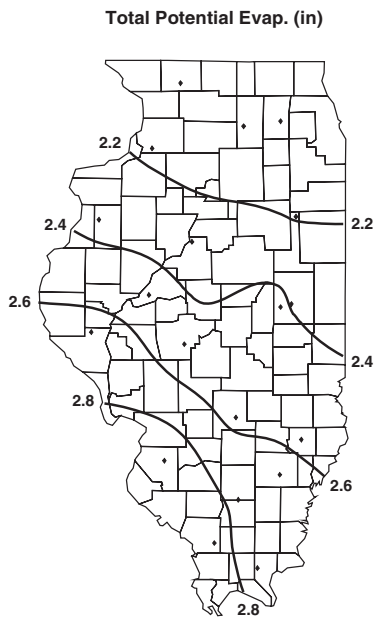
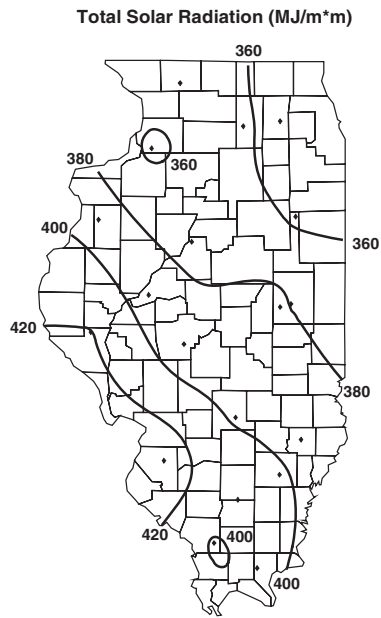
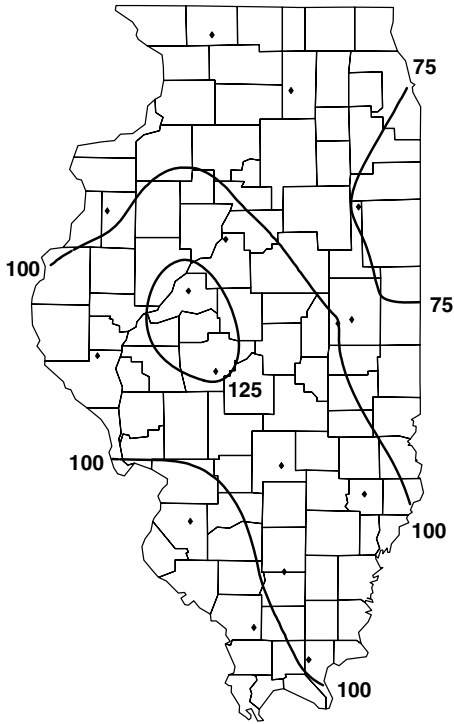
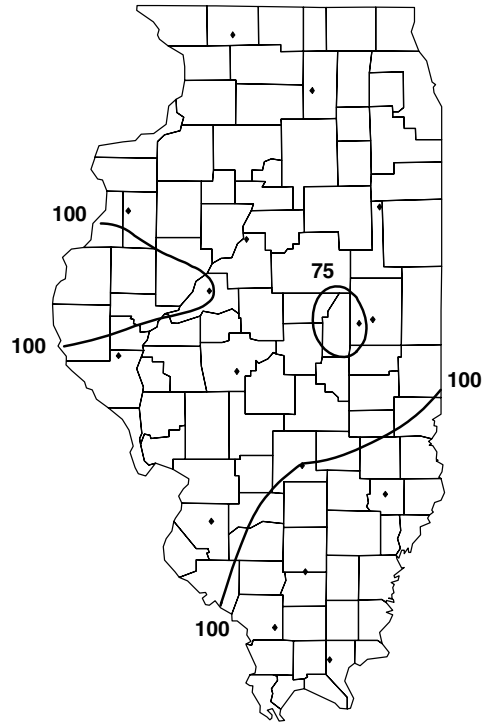


Figure 3. March monthly averages and totals as collected by the Illinois Climate Network

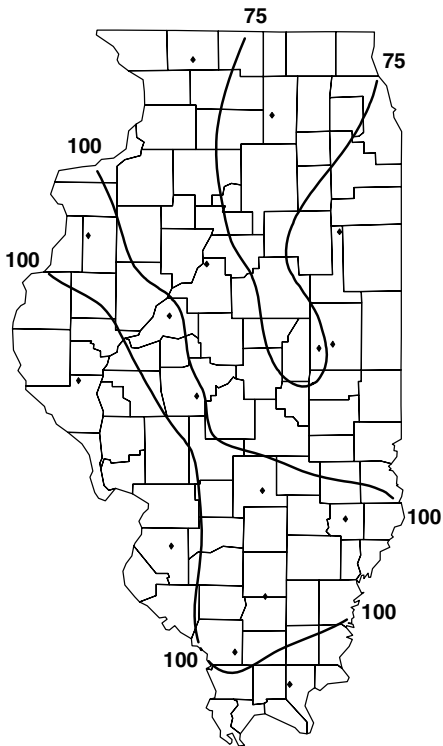
**0 - 6 inch Soil Layer**



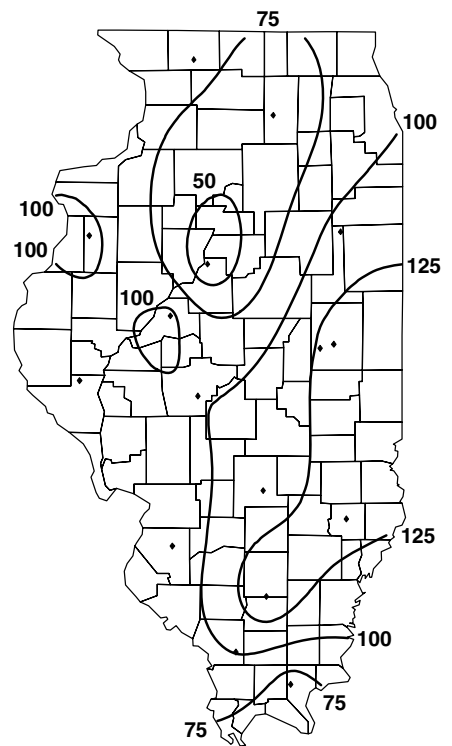
**6 - 20 inch Soil Layer**



**20 - 40 inch Soil Layer**



**40 - 72 inch Soil Layer**



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

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

<i>Location</i>	<i>Apr 1 0 - 6 (inches)</i>	<i>Change from Mar 1 (%)</i>	<i>Apr 1 6 - 20 (inches)</i>	<i>Change from Mar 1 (%)</i>	<i>Apr 1 20 - 40 (inches)</i>	<i>Change from Mar 1 (%)</i>
Freeport (NW)	2.0	1	4.5	4	6.9	4
DeKalb (NE)	2.1	16	4.5	7	6.3	6
Monmouth (W)	2.1	20	4.7	10	7.0	9
East Peoria (C)	2.3	22	5.0	2	7.8	5
Topeka (C)	1.2	16	2.6	8	3.3	16
Stelle (E)	2.0	28	5.1	11	6.9	12
Champaign (E)	1.9	12	4.8	2	6.4	3
Bondville (E)	2.4	6	4.4	-14	6.6	-13
Perry (WSW)	2.4	15	5.4	5	7.7	7
Springfield (WSW)	2.2	21	5.0	2	8.0	6
Brownstown (ESE)	2.8	20	4.9	7	8.3	-1
Olney (ESE)	2.5	8	4.8	2	7.1	2
Belleville (SW)	2.1	15	5.2	11	8.3	4
Carbondale (SW)	2.5	2	5.4	1	8.2	1
Ina (SE)	2.6	2	5.4	1	7.8	1
Fairfield (SE)	2.5	1	5.5	1	7.4	0
Dixon Springs (SE)	2.7	-3	5.5	-3	8.0	-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 March.

**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. 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 March 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 above the median this month (110 percent of the median) and below the long-term mean (91 percent of the mean). Mean streamflow conditions for the month ranged from much below normal in western Illinois to much above normal in far southern Illinois.

**Table 3. Peak Stages for Major Rivers during March 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	10.8	14
	La Salle	224.7	20	18.2	15
	Peoria	164.6	18	13.7	17
	Havana	119.6	14	12.3	21
	Beardstown	88.6	14	11.9	21
	Hardin	21.5	25	21.3	21
Mississippi	Dubuque	579.9	17	9.5	19
	Keokuk	364.2	16	6.0	17
	Quincy	327.9	17	12.1	14
	Grafton	218.0	18	16.1	07
	St. Louis	180.0	30	11.0	15
	Chester	109.9	27	15.1	16
	Thebes	43.7	33	21.2	17
Ohio	Cairo	2.0	40	37.3	18

**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). 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-February levels at 32 reservoirs, by the end of March the water surface elevation had increased at 30 reservoirs, had decreased at one reservoir, and was the same as last month at one location. For the 33 reservoirs with observations reported at the end of March, 17 reservoirs were above normal pool (or target operating level), 5 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 February, by the end of March the water levels at Carlyle Lake had increased slightly, Rend Lake increased 2.7 feet, and Lake Shelbyville increased 3.4 feet. At the end of March, the water surface level at Rend Lake was about 4.8 feet above April 1 target level, Lake Shelbyville was 1.6 feet above target level, and Carlyle Lake was 0.4 feet below 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 March mean level for Lake Michigan was 577.2 feet, compared to a mean level of 577.8 feet in March 2005. The long-term average lake level for March is 578.5 feet, based on 1918-2005 data. Historically, the lowest mean level for Lake Michigan in March occurred in 1964 at 576.0 feet, and the highest level occurred in 1986 at 581.1 feet. The month-end level of Lake Michigan was 577.2 feet.

**Table 4. Provisional Mean Flows, March 2006**

Station	Drainage area (sq mi)	Years of record	2006 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	70	5000**	7192	7877	below normal	72	26
Rock River near Joslin	9549	62	6885	10,690	9553	below normal	70	31
Pecatonica River at Freeport	1326	86	728	1736	1607	below normal	83	31
Green River near Geneseo	1003	66	214	1020	853	much below normal	96	31
Edwards River near New Boston	445	67	92	492	397	much below normal	94	31
Kankakee River at Momence	2294	88	2557	3262	3150	below normal	70	31
Iroquois River near Chebanse	2091	81	2768	3103	2617	normal	45	31
Fox River at Dayton	2642	86	2437	3248	2762	normal	60	31
Vermilion River at Pontiac	579	61	417	730	657	normal	66	31
Spoon River at Seville	1636	88	289	1643	1165	much below normal	96	31
LaMoine River at Ripley	1293	81	214	1297	878	much below normal	93	31
Bear Creek near Marceline	349	61	174	371	247	normal	61	31
Mackinaw River near Congerville	767	56	213	919	684	below normal	86	31
Salt Creek near Greenview	1804	63	1457	2122	1706	normal	59	31
Sangamon River at Monticello	550	92	585	718	605	normal	51	31
South Fork Sangamon near Rochester	867	55	336	1021	724	below normal	75	31
Illinois River at Valley City	26,743	66	19,715	33,370	29,339	below normal	70	31
Macoupin Creek near Kane	868	76	226	898	606	below normal	82	31
Vermilion River near Danville	1290	83	2500	1713	1350	above normal	26	31
Kaskaskia River at Vandalia	1940	35	2442	2930	2259	normal	47	31
Shoal Creek near Breese	735	61	659	978	803	normal	56	31
Embarras River at Ste. Marie	1516	91	3065	2170	1887	above normal	25	31
Skillet Fork at Wayne City	464	85	2250**	787	729	much above normal	2	28
Little Wabash below Clay City	1131	90	3125	1731	1486	above normal	18	31
Big Muddy at Plumfield	794	34	3474	1264	1086	much above normal	3	31
Cache River at Forman	244	81	1417	594	440	much above normal	4	31

**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.

\*\* Estimated.



**Table 5. Reservoir Levels in Illinois, March 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](mailto: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 12th consecutive month. March levels were below normal by 1.4 feet and ranged from 10.0 feet below to 3.7 feet above normal (see table 6). No well is currently at a record low for either March or their period of record.

**Comparison to Previous Month.** Shallow groundwater levels were above those of February. Levels averaged 1.7 feet higher and ranged from 0.2 feet below to 8.3 feet above levels of one month ago.

**Comparison to Same Month, Previous Year.** Shallow groundwater levels in March were below levels of one year ago. Levels averaged 2.2 feet lower and ranged from 11.0 feet below to 1.5 feet above levels in March 2005.

**Table 6. Month-End Shallow Groundwater Level Data Sites, March 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	22.36	-1.23	-0.82	+0.29	-0.81
2	Mt. Morris	Ogle	55.00	29.01	-9.32	-9.34	+0.58	-7.10
3	Crystal Lake	McHenry	18.00	6.65	-1.86	-1.91	+0.72	-3.36
4	Cambridge	Henry	42.00	*40.86	N/A	N/A	N/A	N/A
5	Fermi Lab	DuPage	17.00	5.20	-0.15	-0.46	+3.14	-0.48
6	Good Hope	McDonough	30.00	2.67	+2.66	+3.72	+8.28	+0.80
7	Snicarte	Mason	40.30	39.82	-2.96	-2.78	+0.06	-4.84
8	Coffman	Pike	28.00	12.63	-4.49	-3.50	+4.01	-3.63
9	Greenfield	Greene	20.70	17.73	-9.41	-10.02	+0.91	-11.01
10	Janesville	Cumberland	11.00	4.28	+0.46	+0.28	+1.19	+1.00
11	St. Peter	Fayette	15.00	0.98	+0.49	+0.72	+0.58	+0.04
12	SWS #2	St. Clair	80.00	12.63	+0.07	+1.39	N/A	N/A
13	Boyleston	Wayne	23.00	2.08	-0.31	-0.02	-0.22	-0.71
14	Sparta	Randolph	27.00	4.05	-0.08	+0.60	+1.51	-1.35
15	SE College	Saline	10.19	1.93	-0.41	-0.56	+0.40	-1.60
16	Dixon Springs	Pope	8.63	2.01	-0.18	-0.74	+1.30	-1.04
17	Bondville	Champaign	21.00	1.95	+0.76	+0.58	+2.25	+1.54
Averages					-1.62	-1.43	+1.67	-2.17

### Notes:

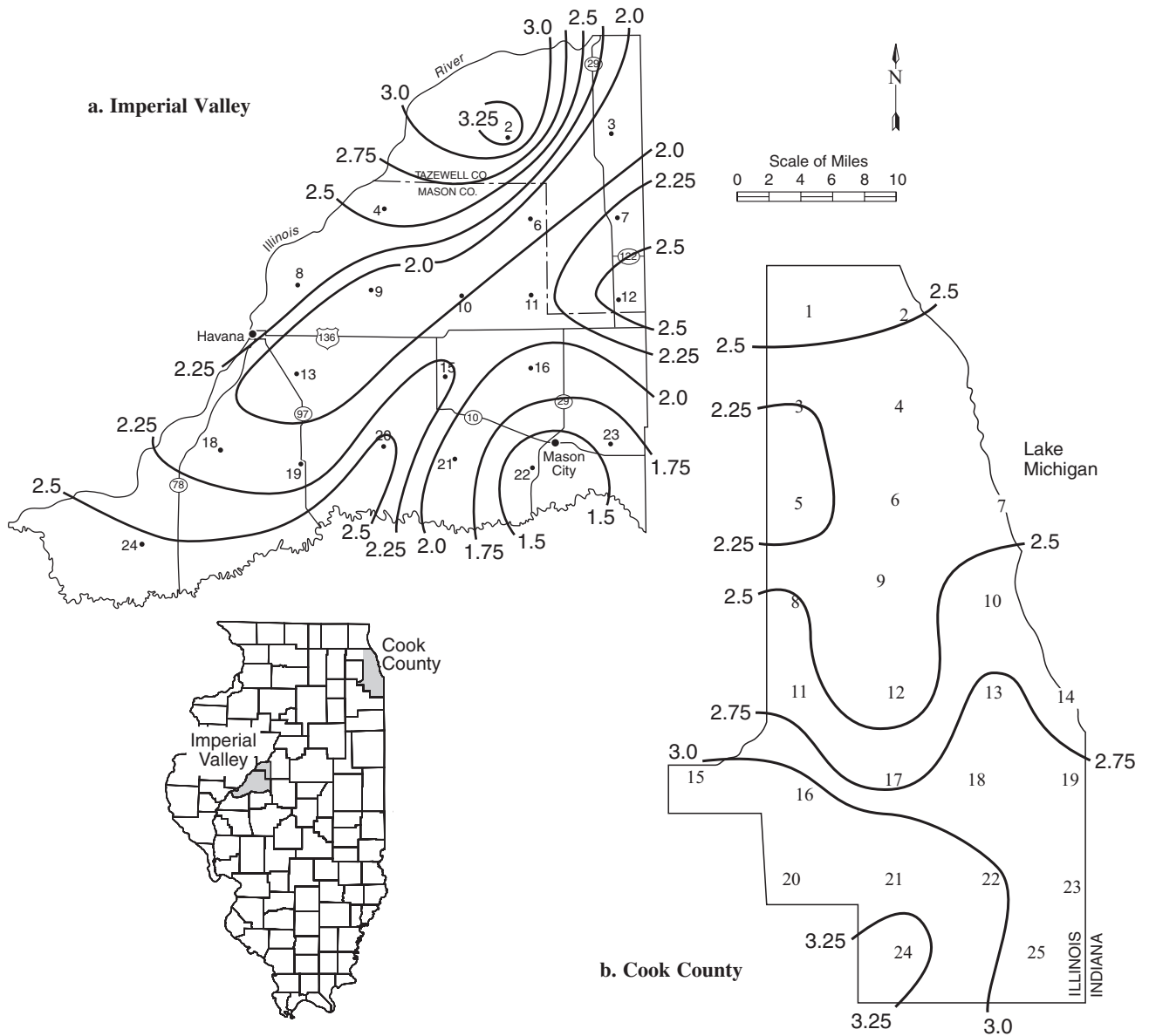
\* - Well not used for analyses.

N/A - Data not available.

## Addenda (Nancy Westcott)

**Imperial Valley Precipitation.** March 2006 precipitation amounts (Figure 5a) were moderate and variable. Gage amounts were greatest in the northwestern portion of the network, and precipitation was lightest in the southeastern region of the network. Individual gage totals ranged from 3.26 inches at site #2 to 1.28 inches at site #22. The 30-year, 1971-2000, average precipitation amounts for March at Havana and Mason City are 2.98 and 2.77 inches, respectively. The March 2006 network average of 2.17 inches is about 106 percent of the 13-year (1993-2005) IVWA March network average of 2.04 inches.

**Cook County Precipitation.** March 2006 precipitation amounts (Figure 5b) also were moderate. The greatest precipitation was found in the southwestern area of the network, and the lightest precipitation was in the north-central portion of the network. Precipitation values ranged from 3.37 inches at Site #24 (Matteson) to 2.16 inches at Site #5 (Franklin Park). The March 2006 network average of 2.71 inches is about 118 percent of the 16-year (1990-2005) March network average of 2.30 inches.



**Figure 5. Long-term rain gage network precipitation totals (inches) for March 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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