ILLINOIS DEPARTMENT OF NATURAL RESOURCES

Illinois State Water Survey

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ILLINOIS WATER AND CLIMATE SUMMARY
May 2004

2004 Overview (Bob Scott)

Temperatures in Illinois during May were above average, while precipitation was well above average, the eighth wettest May since 1895. Soil moisture within the top 40 inches of soil was well above the long-term statewide average. Mean streamflows were above median heights. Shallow groundwater levels were below long-term average depths.

Temperatures across Illinois (Figure 1) for May were above average (a 2.7-degree departure). Crop Reporting District (CRD) temperatures ranged from 0.5 degrees above average (northwest and northeast) to 4.3 degrees above average (southeast).

Precipitation amounts for the state were well above average (Figure 1). The statewide average of 7.52 inches represents a 3.26-inch departure or 176 percent of average. May totals were highest in the southeast CRD (9.14 inches) and lowest in the west CRD (6.24 inches). Compared to average precipitation values for May, totals ranged from 138 percent of average in the west CRD to 210 percent of average in the northwest CRD.

Soil moisture in the 0- to 40-inch (0- to 100-centimeter) layer at the end of May was well above average across Illinois in all layers (Figure 1). Soils in middle layers were dry in a small region of central Illinois, however.

Mean provisional streamflow statewide was above the median flow, 181 percent of median (Figure 1). Rivers in Illinois recorded mean discharges in the much above normal to below normal range this month. Peak stages recorded exceeded flood stage at some stations on the Illinois River, several stations along the Illinois border of the Mississippi River, and on the Ohio River at Cairo.

Water surface levels at the end of May were below the normal pool/target operating level at two of 33 reporting reservoirs. Water surface levels at Rend Lake, Lake Shelbyville, and Carlyle Lake were above target levels at the end of May. Lake Michigan's mean level remains below the long-term average.

Statewide, **shallow groundwater levels** continue to be below average for the 21st consecutive month (Figure 1). Deviations averaged 0.6 feet below normal, 1.6 feet higher than April levels, and approximately 0.8 feet above May levels one year ago.

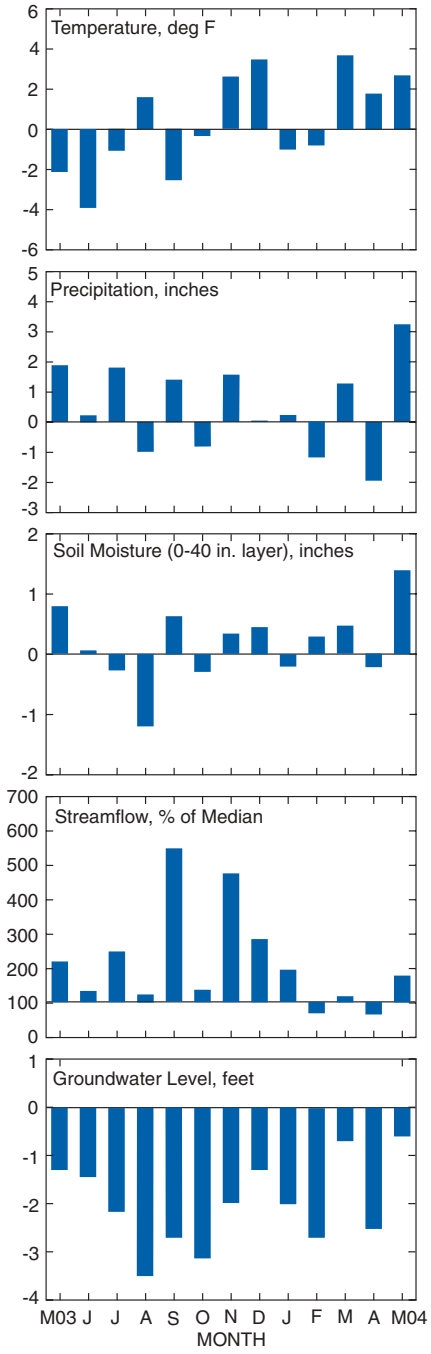

Figure 1.
Statewide departures from normal

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

Contact

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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 May were above average (Figure 2 and Table 1), the 19th warmest May since 1895. Extremes ranged from 24°F at Streamwood on May 3 to 95°F at Kaskaskia on May 8. Based on provisional data, statewide temperature departures for March–May and December–May were 2.7 and 1.8 degrees above average, respectively, the 7th and 14th warmest such periods since 1895.

Precipitation during May was well above average statewide (Figure 2 and Table 1), the eighth wettest May since 1895. Precipitation recorded in all CRDs was among the top 18 wettest Mays since 1895. The northeast and northwest CRDs were the second and fourth wettest Mays for those districts, respectively. Mt. Olive reported the highest one-day precipitation, 3.80 inches, while Hillsboro reported the highest monthly precipitation total, 10.81 inches.

S**evere weather** was widely reported in Illinois during May, including preliminary reports of 26 tornadoes on eight separate days. Tornado damage was relatively minor in most cases, with no reports of deaths or injuries statewide. Tornadoes were reported near Lee and Waterman on May 10, near Crete on May 13, near Washington and Bloomington on May 18, and near St. Rose on May 19. There was heavy damage to a farm near Chenoa after five tornadoes landed near Auburn, Romeoville, Gridley, Chenoa, and Pontiac on May 23. Tornadoes near Johnsonville, Manito, and Divernon damaged houses and farm equipment on May 24. Tornadoes were reported in West Frankfort and Thompsonville on May 25. At least 10 tornadoes were reported in Clinton, Fayette, Jackson, Livingston, Madison, McDonough, Tazewell, Washington, Williamson, and Woodford Counties on May 30. Hail and wind damage across the state also were widely reported on 18 days. Most of the wind damage was confined to trees and power lines.

Illinois Climate Network (ICN) Data. Average daily wind speeds across Illinois for May (Figure 3) ranged from 4 mph at Dixon Springs to near 12 mph at Bondville and Stelle. The highest wind gusts for the month, 56 mph, were recorded at Stelle on May 30. The prevailing wind direction was generally southerly to southwesterly across the state. Wind speeds in excess of 8 mph varied from 40 hours at Dixon Springs and Rend Lake to 548 hours at Bondville. (May has 744 hours.) Average air temperatures ranged from the low 60s in northern Illinois to near 70°F in southern Illinois.

Solar radiation totals in May showed strong seasonal increases, ranging from 533 Mega-Joules per meter squared (MJ/m^2) at St. Charles to near 650 MJ/m^2 in southern Illinois. Potential evapotranspiration observations varied from 4.3 inches at St. Charles to 5.6 inches at Belleville. Soil temperatures at the 4- and 8-inch levels ranged from 60°F in northern Illinois to near 70°F in southern Illinois.

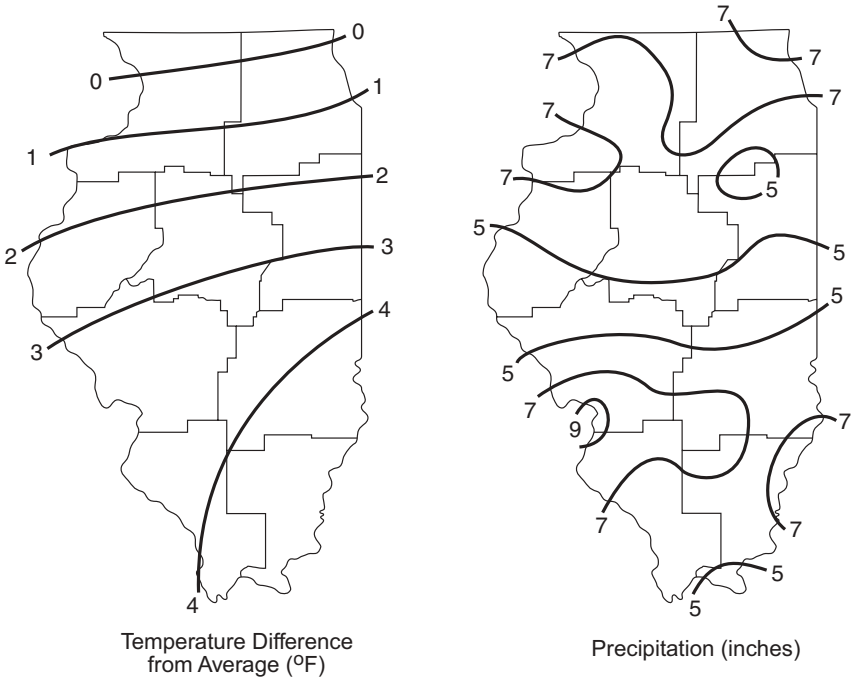

Figure 2. Illinois temperature and precipitation during May 2004

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		
	May 04 Amount	% Avg	Temp Dev	Mar 04-May 04	% Avg	Temp Dev	Dec 03-May 04	% Avg	Temp Dev	Jun 03-May 04	% Avg	Temp Dev
Northwest	8.60	210	0.5	15.09	149	2.1	19.86	132	1.9	37.38	103	1.0
Northeast	7.94	201	0.5	13.86	136	2.2	17.76	113	1.6	37.51	102	0.7
West	6.24	138	2.5	11.84	107	2.6	16.86	103	1.8	39.24	105	0.7
Central	6.87	165	2.5	12.68	118	2.8	16.42	99	1.8	38.15	103	0.6
East	6.33	155	3.0	12.70	119	3.1	17.07	102	1.8	42.65	113	0.6
West-southwest	6.65	157	3.3	12.98	114	3.0	18.50	103	1.8	41.82	111	0.6
East-southeast	7.70	179	4.0	13.87	116	3.2	21.36	109	1.9	45.21	110	0.7
Southwest	8.40	190	3.9	16.03	127	2.8	21.98	104	1.7	42.01	98	0.7
Southeast	9.14	193	4.3	16.33	121	2.9	22.80	99	1.7	42.54	96	0.8
State Average	**7.52**	**176**	**2.7**	**13.87**	**123**	**2.7**	**19.12**	**107**	**1.8**	**40.70**	**105**	**0.7**

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 June call for equal chances of above, below, and average temperatures and precipitation across Illinois. Outlooks for climatological summer (June–August) call for a slight chance of above average temperatures in southeastern Illinois, with equal chances of above, below, and average temperatures and precipitation across the rest of the state.

Soil Moisture Information (Bob Scott)

Well above average precipitation statewide in Illinois during May resulted in normal to well above average soil moisture conditions near the soil surface at the end of the month (Figure 4). Moisture values in the 0- to 6-inch layer ranged from 125 percent of average at Brownstown to more than 200 percent of average at Topeka and DeKalb. Conditions in the 6- to 20-inch layer were above to well above average everywhere except for very dry soils in central Illinois. Moisture amounts ranged from 179 percent of average at DeKalb to less than 10 percent of average at Springfield. Soil moisture 20 to 40 inches deep showed a smaller range and varied from 58 percent of average at Springfield to 138 percent of average at DeKalb. Soils in the 40- to 72-inch layer were very moist in southern Illinois but generally close to normal elsewhere. Values in that layer ranged from 195 percent of average at Rend Lake to 75 percent of average at Topeka and Dixon Springs. Overall, soil moisture in Illinois at the end of May was well above average (Figure 1).

Compared to the end of last month, soil moisture in the 0- to 6-inch layer generally increased, and by a considerable amount at a few sites (Table 2). Increases of approximately 40 to 65 percent occurred at five sites in northern and southern Illinois. Elsewhere, increases were generally in the 10 to 30 percent range. Bondville showed the only decrease in soil moisture in this layer (15 percent). Soil moisture 6 to 20 inches deep was nearly 50 percent higher at Belleville, while changes elsewhere ranged between 18 percent higher and 15 percent lower than last month. Only small changes in soil moisture (10 percent or less) were observed in the 20- to 40-inch layer.

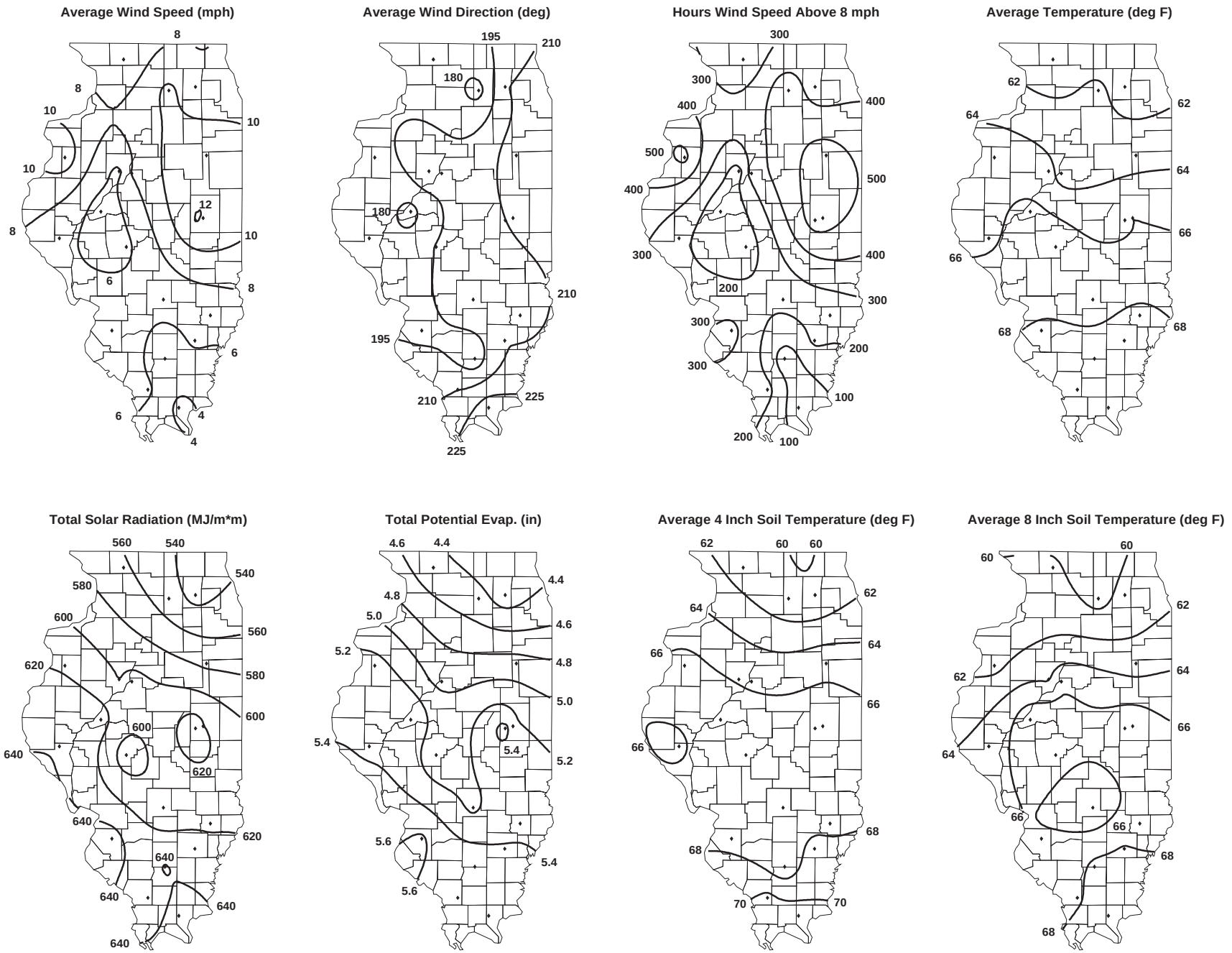

Figure 3. May monthly averages and totals as collected by the Illinois Climate Network

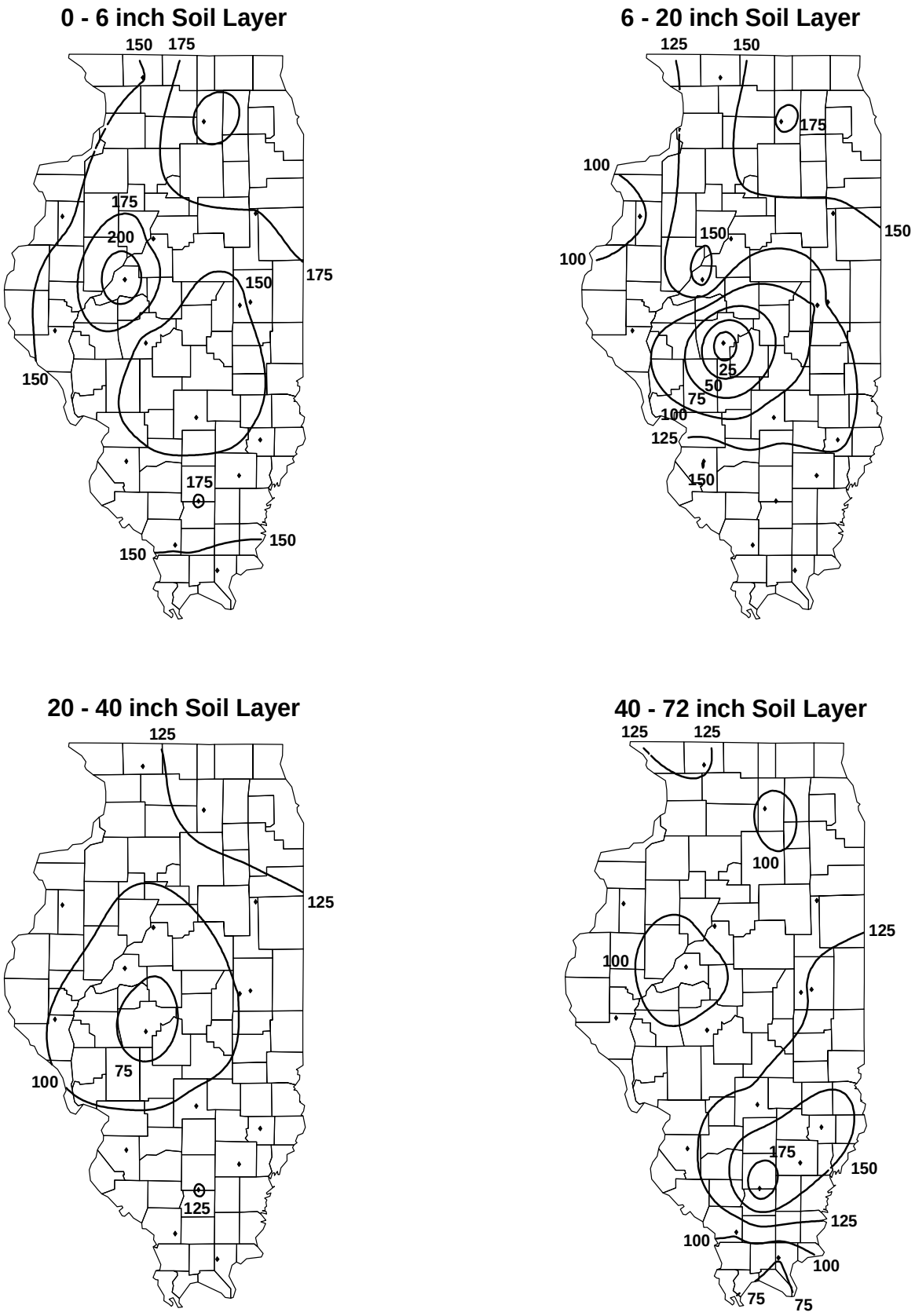

Figure 4. June 1 observed percent-of-normal soil moisture based on 1985-1995 mean

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

Location	June 1 0 - 6 (inches)	Change from May 1 (%)	June 1 6 - 20 (inches)	Change from May 1 (%)	June 1 20 - 40 (inches)	Change from May 1 (%)
Freeport (NW)	2.0	22	4.5	15	7.2	8
DeKalb (NE)	2.6	39	5.8	18	7.9	8
Monmouth (W)	1.9	9	3.7	-13	6.6	0
East Peoria (C)	2.1	39	5.0	13	7.6	0
Topeka (C)	1.3	23	2.7	5	2.7	-6
Stelle (E)	2.4	13	6.0	5	7.3	-2
Champaign (E)	2.3	19	5.4	9	6.4	3
Bondville (E)	1.8	-15	4.3	-12	8.0	-4
Perry (WSW)	2.2	14	4.7	-14	7.7	-7
Springfield (WSW)	1.9	5	3.6	-15	7.0	-10
Brownstown (ESE)	2.3	13	4.3	8	8.1	0
Olney (ESE)	2.5	32	4.7	11	7.1	2
Belleville (SW)	2.5	57	5.5	49	8.7	9
Carbondale (SW)	2.6	15	5.0	5	8.0	1
Ina (SE)	2.8	64	5.4	8	7.8	1
Fairfield (SE)	2.7	55	5.5	15	7.6	1
Dixon Springs (SE)	2.4	13	5.3	5	8.3	1

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 lower Illinois River peaked above flood stage during the last few days of May as the river was rising. Most stations on Mississippi River along the Illinois border recorded peak stage above flood stage, as did the Ohio River at Cairo on May 31.

Provisional monthly mean flows for 26 streamgaging stations located throughout Illinois are shown in Table 4. Data 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. 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 May mean flow for each year of record, and selecting the middle value, 50 percent exceedence probability.

Mean provisional flow statewide was above the median this month (181 percent of the median) and above the mean (115 percent of the mean). Flows in northern Illinois were generally in the normal to above normal range this month, although the Kankakee River at Momence was below normal again this month. Flows in central and southern Illinois were normal to above normal.

Table 3. Peak Stages for Major Rivers, May 2004

River	*Station*	*River mile**	*Flood stage (feet)**	*Peak stage (feet)***	*Date*
Illinois					
	Morris	263.1	13	12.0	31
	La Salle	224.7	20	19.9	31
	Peoria	164.6	18	14.5	31
	Havana	119.6	14	14.2	31
	Beardstown	88.6	14	15.3	31
	Hardin	21.5	25	25.9	29
Mississippi					
	Dubuque	579.9	17	15.8	24
	Keokuk	364.2	16	16.3	31
	Quincy	327.9	17	18.7	31
	Grafton	218.0	18	19.8	29
	St. Louis	180.0	30	28.1	29
	Chester	109.9	27	29.4	30
	Thebes	43.7	33	33.4	31
Ohio					
	Cairo	2.0	40	41.8	31

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.

Water-Supply Lakes and Major Reservoirs. Table 5 lists reservoirs in Illinois, their normal pool or target water surface elevation, and other data related to observed variations in water surface elevations. Reservoir levels are reported in terms of their difference from normal pool (or target level). Reservoir levels are obtained from a network of cooperating reservoir operators who are contacted each month by 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),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 levels at the end of April at 32 reservoirs, by the end of May, the water surface elevation had risen at 22 reservoirs, was the same as last month at 7 reservoirs, and had decreased at 3 reservoirs. For the 33 reservoirs with observations reported at the end of May, 21 reservoirs were above normal pool (or target operating level), 10 reservoirs were at normal pool, and 2 reservoirs were below normal pool.

Major Reservoirs. Water levels at Carlyle Lake and Lake Shelbyville rose dramatically and were 4.7 and 1.2 feet above target levels, respectively. The water level at Rend Lake also increased and was 3.4 feet above normal pool.

Great Lakes. Current month mean and end-of-month values are provisional and are relative to International Great Lakes Datum 1985. The May mean level for Lake Michigan was 577.8 feet, compared to a mean level of 577.2 feet in 2003. The long-term average lake level for May is 579.2 feet, based on 1918–2002 data. Historically, the lowest mean level for Lake Michigan in May occurred in 1964 at 576.6 feet, and the highest level occurred in 1986 at 581.6 feet. The month-end level of Lake Michigan was 578.2 feet.

Table 4. Provisional Mean Flows, May 2004

Station	*Drainage area (sq mi)*	*Years of record*	*2004 mean flow (cfs)*	*Long-term flows* *Mean* (cfs)*	*Median (cfs)*	*Flow condition*	*Percent chance of exceedence*	*Days of data this month*
Rock River at Rockton	6363	68	8058	5378	4759	above normal	16	31
Rock River near Joslin	9549	60	11,900	8579	7493	above normal	18	31
Pecatonica River at Freeport	1326	84	1951	1010	811	much above normal	8	31
Green River near Geneseo	1003	64	1366	994	831	above normal	24	31
Edwards River near New Boston	445	65	835	489	340	above normal	19	30
Kankakee River at Momence	2294	85	1832	2913	2786	below normal	73	31
Iroquois River near Chebanse	2091	79	1784	2718	2133	normal	60	31
Fox River at Dayton	2642	83	4888	2449	2066	much above normal	9	31
Vermilion River at Pontiac	579	59	861	738	572	normal	33	31
Spoon River at Seville	1636	86	1407	1763	1226	normal	44	30
LaMoine River at Ripley	1293	79	1007	1440	811	normal	44	31
Bear Creek near Marceline	349	58	473	415	190	above normal	28	31
Mackinaw River near Congerville	767	54	995	927	701	normal	32	31
Salt Creek near Greenview	1804	61	2878	2450	1748	normal	32	30
Sangamon River at Monticello	550	90	886	729	484	above normal	28	31
South Fork Sangamon near Rochester	867	53	1841	1040	461	above normal	18	31
Illinois River at Valley City	26,743	64	26,787	36,870	35,495	normal	61	30
Macoupin Creek near Kane	868	74	858	935	375	normal	30	31
Vermilion River near Danville	1290	81	1269	1691	1229	normal	47	30
Kaskaskia River at Vandalia	1940	33	1831	2149	1741	normal	46	29
Shoal Creek near Breese	735	59	1467	851	469	above normal	16	31
Embarras River at Ste. Marie	1516	89	1780	1960	1099	normal	35	26
Skillet Fork at Wayne City	464	83	759	638	242	above normal	22	31
Little Wabash below Clay City	1131	88	1751	1451	649	above normal	22	31
Big Muddy at Plumfield	794	32	1106	1410	840	normal	44	31
Cache River at Forman	244	79	307	425	291	normal	49	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 2002.

Table 5. Reservoir Levels in Illinois, May 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 May by 0.6 feet and ranged from 11.1 feet below average to 2.7 feet above average (Table 6). Levels continued to be below average by more than 11 feet at Mt. Morris (Ogle County); however, water levels at Cambridge (Henry County) were finally above average, by 2.3 feet, for the first time since July 2002.

Comparison to Previous Month. Shallow groundwater levels were above those of April. Levels averaged 1.6 feet higher and ranged from 1.1 feet below to 17.2 feet above April levels. That extreme rise occurred at Cambridge (Henry County).

Comparison to Same Month, Previous Year. Shallow groundwater levels in May were above levels of a year ago. Levels averaged 0.8 feet higher and ranged from 3.2 feet lower to 8.8 feet above levels of last year.

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

					Deviation from			
Number	*Well name*	*County*	*Well depth (feet)*	*This month's reading (depth to water, feet)*	*15-year avg. level (feet)*	*Period of record avg. (feet)*	*Previous month (feet)*	*Previous year (feet)*
1	Galena	JoDaviess	25.0	20.33	+0.07	+0.43	+1.00	+0.75
2	Mt. Morris	Ogle	55.0	27.94	-12.72	-11.08	+2.18	+5.06
3	Crystal Lake	McHenry	18.0	1.49	+2.18	+2.65	+1.65	+4.44
4	Cambridge	Henry	42.0	3.79	+1.63	+2.27	+17.17	+8.77
5	Fermi Lab	DuPage	17.0	5.81	-0.43	-0.29	+1.13	+1.10
6	Good Hope	McDonough	30.0	4.44	+1.14	+1.74	+0.30	+0.93
7	Snicarte	Mason	42.0	38.69	-2.66	-2.62	+0.33	-1.58
8	Coffman	Pike	28.0	9.46	-2.25	-0.64	-0.18	-1.09
9	Greenfield	Greene	20.7	7.94	-0.21	+0.18	-0.60	+2.43
10	Janesville	Cumberland	11.0	5.51	-0.29	-0.17	-0.02	-0.11
11	St. Peter	Fayette	15.0	0.95	+1.20	+1.80	+2.55	+0.39
12	SWS #2	St. Clair	80.0	N/A	N/A	N/A	N/A	N/A
13	Boyleston	Wayne	23.0	5.46	-2.15	-1.56	-1.10	-2.83
14	Sparta	Randolph	27.0	5.19	-1.23	+0.45	+0.77	-3.21
15	SE College	Saline	10.19	3.89	-0.32	-0.27	+0.43	-1.57
16	Dixon Springs	Pope	8.63	3.32	-0.22	-0.68	-0.11	-1.38
17	Bondville	Champaign	21.0	4.18	-1.02	-0.97	-0.50	-0.01
				Averages	-1.08	-0.55	+1.56	+0.76

Note:
N/A = Data not available.

Addendum

Long-Term Precipitation Networks (Nancy Westcott)

Imperial Valley Precipitation. May 2004 precipitation amounts (Figure 5a) were generally heavy. Gage amounts were greatest in the southeastern portion of the network, and precipitation was lightest in the northeastern corner of the network. Individual gage totals ranged from 8.40 inches at site #22 to 3.48 inches at site #3. The 30-year, 1971–2000, average precipitation amounts for May at Havana and Mason City, are 4.43 and 4.20 inches, respectively. The May 2004 network average of 5.56 inches is about 117 percent of the 11-year (1992–2002) May network average of 4.74 inches.

Cook County Precipitation. May 2004 precipitation amounts (Figure 5b) were heavy. Precipitation was greatest in the south-central portion of the network and lightest in the northwestern region of the network. Precipitation values ranged from 8.11 inches at site #21 (Tinley Park) to 4.35 inches at site #5 (Franklin Park). The May 2004 network average of 6.40 inches is about 158 percent of the 14-year (1990–2003) May network average of 4.06 inches.

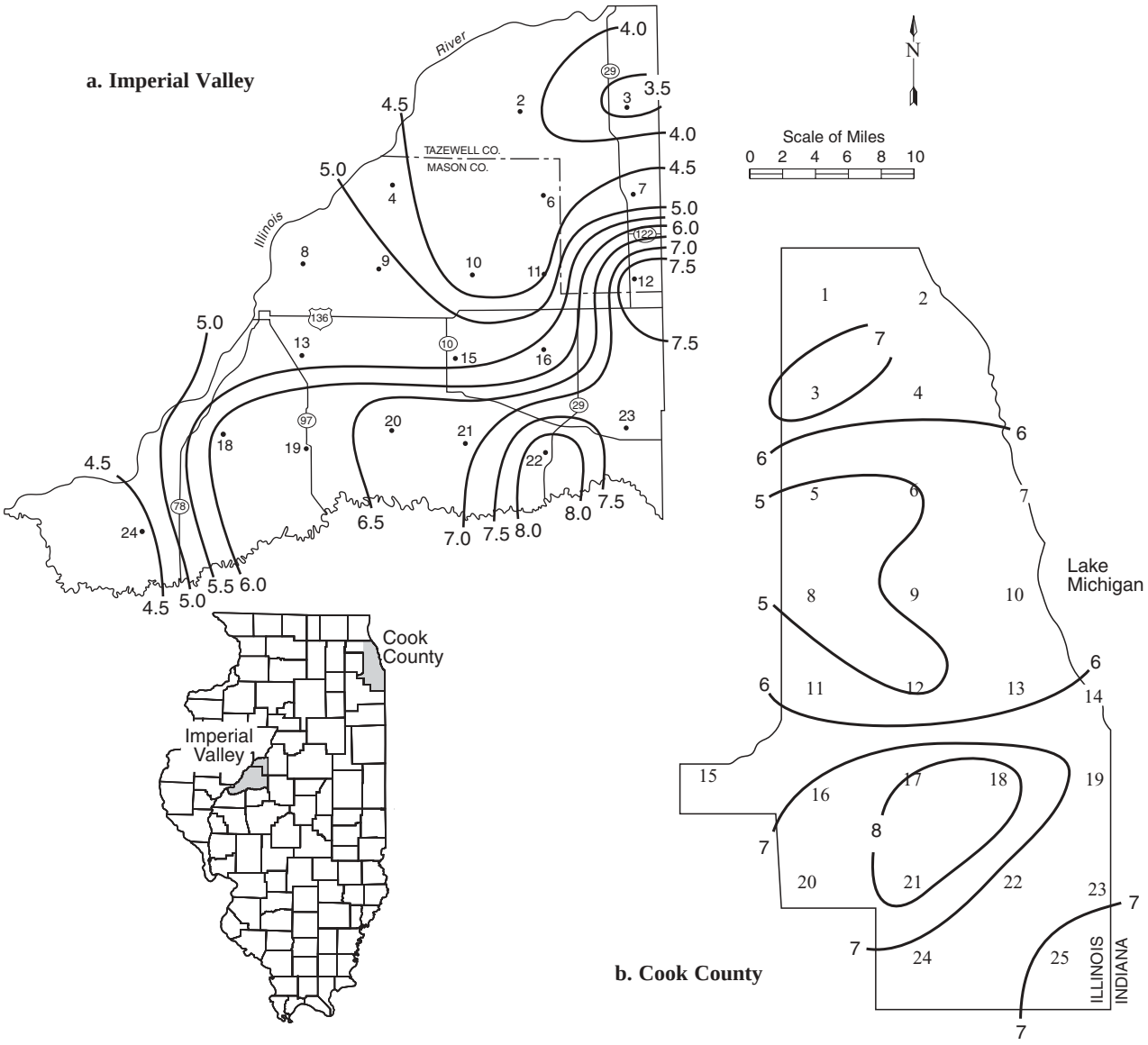

Figure 5. Long-term raingage network precipitation totals (inches) for May 2004

Data sources for information in this publication include the following:
CPC - Climate Predication 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/