

## ILLINOIS WATER AND CLIMATE SUMMARY April 2001

### April 2001 Overview (Bob Scott)

Temperatures in Illinois during April were much above average, and precipitation was below average. Soil moisture within the top 40 inches of soil approximated the long-term statewide average. Mean streamflows were below median heights, and shallow ground-water levels were below the long-term average depths. Dry conditions are indicated in all water resources over extreme southern Illinois

**Temperatures** across Illinois (Figure 1) for April were well above average (a 4.2-degree departure). This was the 7th warmest April since 1895. By crop reporting districts (CRDs), temperatures ranged from 3.5 degrees above average (northwest) to 4.7 degrees above average (east).

**Precipitation** amounts (Figure 1) were below the long-term average value for the month. The statewide average of 3.06 inches represents a -0.71-inch departure or 81 percent of average. District precipitation totals ranged from 2.32 inches (southeast and east-southeast) to 3.67 inches (northwest). Precipitation totals ranged from 56 percent of average (southeast) to 103 percent of average (northwest). The National Drought Mitigation Center includes extreme southern Illinois in a region of moderate drought conditions (their lowest level of drought alert).

**Soil moisture** across Illinois in the 0- to 40-inch (0- to 100-centimeter) layer at the end of April (Figure 1) was normal. Regionally, soil moisture conditions near the surface were slightly below normal in southeastern Illinois and above normal in central Illinois. In all other layers, conditions were near normal statewide, except for above normal moisture levels in the deepest layer over southeastern Illinois.

**Mean provisional streamflow** statewide was below the median flow, 85 percent of median (Figure 1). Rivers in northwestern Illinois recorded mean discharges in the normal to above normal range this month. Flows in central Illinois were generally in the normal range, while flows in southern Illinois were below normal. Peak stages on the Illinois River did not exceed flood stage, except at Hardin. Mississippi River stations from Dubuque to Grafton recorded stages above flood stage, as did the gage at Chester. The Ohio River at Cairo did not exceed flood stage this month.

**Water surface levels** at the end of April were below the normal pool at 14 of 34 reporting reservoirs. Levels at Carlyle Lake and Lake Shelbyville were below target operating levels, while Rend Lake was above the target level. Lake Michigan's mean level remains below the long-term average.

Statewide, **shallow ground-water levels** were below average for April by 0.6 feet. Levels averaged 0.8 feet below levels of last month and were approximately 1.2 feet above April levels one year ago.

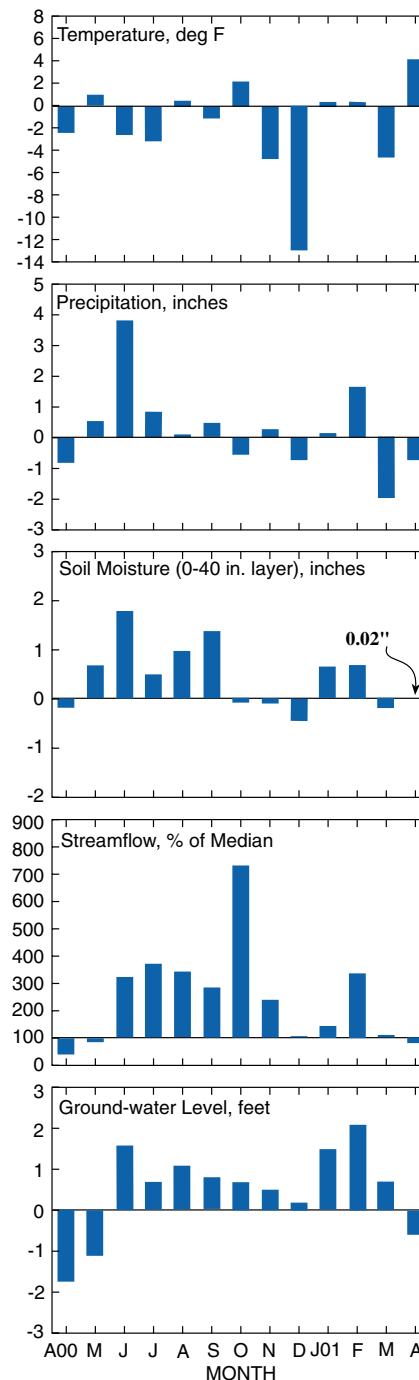


Figure 1.  
Statewide departures from normal

*Note: The WARM Network maps and extended network descriptions appear in the January and July issues.*

### Contact

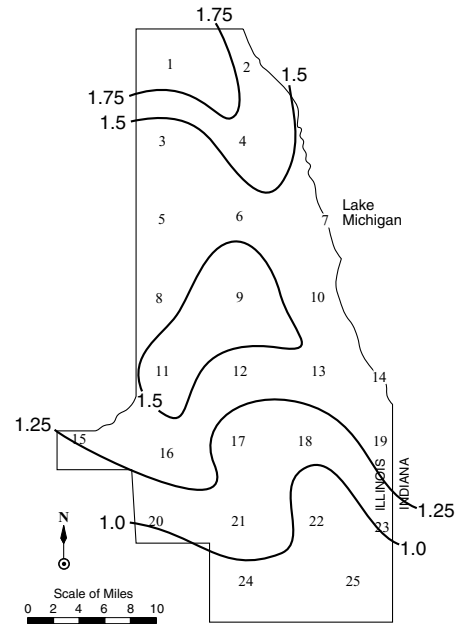
Bob Scott: (217) 333-4966, email: r-scott5@uiuc.edu  
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**Weather/Climate Information (Nancy Westcott, Jim Angel, and Bob Scott)**

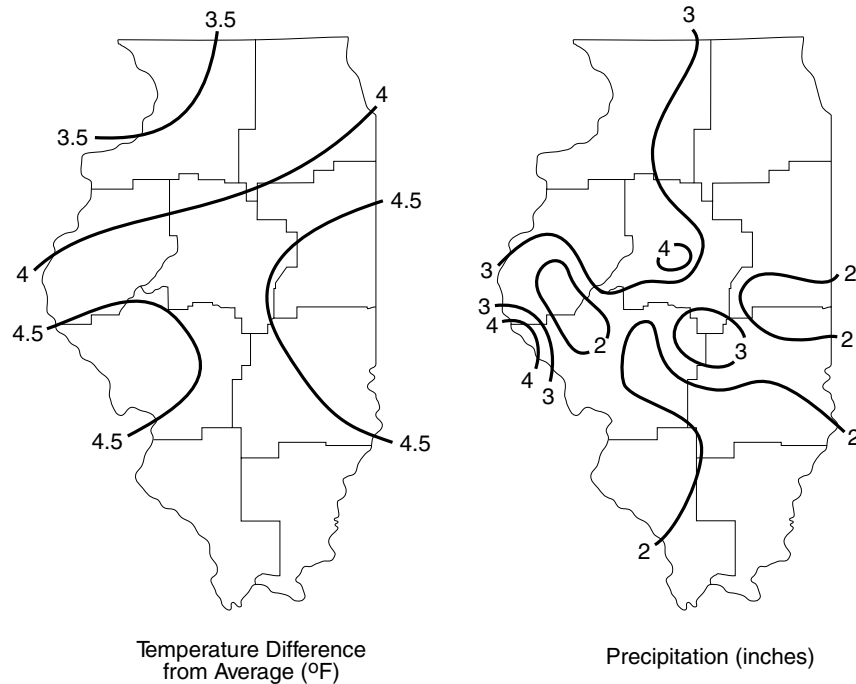
**Cook County Precipitation.** March precipitation amounts (Figure 2) were relatively small. Site values for the month ranged from 0.92 inches at site #24 (Matteson) to 1.98 inches at site #1 (Northbrook). Precipitation was heaviest in the far northwest corner and in the central portion of the network, and lightest in southern areas. The March 2001 network average of 1.33 inches was about 56 percent of the 11-year (1990–2000) March network average of 2.39 inches.

**Temperatures** across Illinois for April were much above average for the state as a whole (Figure 3 and Table 1), ranking as the 7th warmest April since 1895. Across the state, temperatures averaged 56.9°F for April. (The warmest April was in 1955 at 58.1°F.) In general, temperatures were warmest during the first 14 days of April, maximizing at 18 degrees above average during April 6–9. Temperatures returned to near average April 15–19 before again becoming above average for the remainder of the month. The warmest reading for the month, 90°F, occurred on April 10 at Lebanon. The coolest reading, 22°F, occurred on April 18 at Streamwood.

**Precipitation** across Illinois was below the monthly average (Figure 3 and Table 1). Although the northwest CRD reported 103 percent of average, all remaining CRDs reported below average precipitation for April. The southeast CRD measured only 56 percent of average precipitation. Even so, the 3.06 inches for the state was not significantly below average. Nevertheless, April precipitation appeared to be a continuation of the below average precipitation observed in March. The largest one-day precipitation amount in the state was 3.01 inches at Edwardsville. The largest monthly total was 5.17 inches at Woodhull (northwest CRD). Dry conditions continue in extreme southern Illinois. Since late September 2000, the southernmost CRDs have reported 75 percent of the average precipitation for the period, a deficit of approximately 6.25 inches.



**Figure 2.**  
**Cook County precipitation (inches) during March 2001**



**Figure 3. Illinois temperatures and precipitation during April 2001**

**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		
	Apr 01 Amount	% Avg	Temp Dev	Feb 01-Apr 01	% Avg	Temp Dev	Nov 00-Apr 01	% Avg	Temp Dev	May 00-Apr 01	% Avg	Temp Dev
Northwest	3.67	103	3.5	8.79	121	-0.8	15.21	117	-3.2	40.66	115	-2.0
Northeast	3.20	86	3.6	7.28	96	-0.1	13.95	99	-2.3	39.66	110	-1.3
West	3.61	98	4.3	9.34	117	-0.7	16.57	117	-3.5	39.12	105	-1.9
Central	3.58	95	4.3	8.35	101	0.0	16.27	107	-2.8	38.50	105	-1.5
East	3.09	83	4.7	7.49	90	0.7	14.42	92	-2.3	38.42	104	-1.3
West-southwest	3.03	82	4.6	7.86	89	0.0	14.95	91	-3.2	44.41	117	-1.8
East-southeast	2.32	61	4.4	6.15	63	0.4	13.79	74	-2.9	47.94	120	-1.7
Southwest	2.55	65	4.0	7.97	74	0.0	15.74	77	-3.5	43.16	104	-2.1
Southeast	2.32	56	4.0	8.11	69	0.2	17.33	78	-3.1	44.36	102	-1.8
<b>State Average</b>	<b>3.06</b>	<b>81</b>	<b>4.2</b>	<b>7.88</b>	<b>89</b>	<b>-0.1</b>	<b>15.23</b>	<b>93</b>	<b>-3.0</b>	<b>41.94</b>	<b>110</b>	<b>-1.7</b>

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

**Severe weather** returned to Illinois in April. Strong thunderstorms moved through the state on April 5, leading to several reports of hail in central Illinois, some the size of golf balls. Thunderstorms redeveloped the next morning with additional reports of hail and some wind damage in central and eastern Illinois. More thunderstorms broke out on April 8. A tree fell on a car on Route 31 in Kane County, killing the driver. Two tornadoes were reported about 25 miles north of Peoria, but no damage was associated with them. Among several reports of hail was the statement that “hail was piled 3 inches deep... covering the road” near Minonk. Severe thunderstorms occurred in southern Illinois on April 10. An apartment roof and a garage were damaged by a tornado at Pontoon Beach. On the same day, 4.5-inch hail was reported at Shelbyville and damaged vehicles at the Hudson Power Plant. Wind damage from this storm also occurred in central and southern Illinois.

**Illinois Climate Network (ICN) Data.** Average daily wind speeds across Illinois for April (Figure 4) ranged from 6 mph at Rend Lake and Dixon Springs to near 14 mph at Monmouth and Bondville. The highest wind gust for the month, 60 mph, occurred at Bondville on April 9. The prevailing wind direction was generally from the south-southwest across Illinois. Wind speeds in excess of 8 mph ranged from 153 hours at Rend Lake to 573 hours at Bondville. (April has 720 hours.) Average temperatures across the state ranged from 51°F at DeKalb to 64°F at Dixon Springs. Solar radiation continued to reflect seasonal increases and low precipitation totals (fewer clouds) during April. Values ranged from about 545 Mega-Joules per meter squared (MJ/m<sup>2</sup>) at St. Charles and Stelle to 610 MJ/m<sup>2</sup> at Rend Lake. Potential evapotranspiration varied from near 4.1 inches at St. Charles and DeKalb to 5.0 inches at Rend Lake. Average 4-inch soil temperatures for April ranged from near 50°F across much of northern Illinois to the low 60s in far southeastern Illinois. Average 8-inch soil temperatures for April ranged from near 50° F across north-central Illinois to the upper 50s in southeastern and west-central Illinois.

**Extended climate outlooks** issued by the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Climate Prediction Center for May and for May–August call for equal chances of above, below, and normal temperatures and precipitation over all of Illinois.

### Soil Moisture Information (Bob Scott)

Precipitation across Illinois was below average for April, especially across the southern part of the state (Table 1). This allowed near surface soils to dry out in southern areas. At the end of April, normal to slightly below normal soil moisture conditions were found in the 0- to 6-inch layer across southern and east-central Illinois, but above normal conditions were measured in part of central Illinois (Figure 5). Values ranged from 65 percent of normal at Bondville to more than 175 percent of normal at Topeka. Moisture conditions in the 6- to 20- and 20- to 40- inch layers indicated near normal soil moisture statewide. Values in the 40- to 72-inch layer continued to show above normal soil moisture in southeastern Illinois and normal moisture conditions elsewhere. An exception to this pattern was found at Dixon Springs where drier soils were observed (75 percent of normal). Overall, statewide soil moisture in Illinois for April approximated the long-term normal for the month (Figure 1).

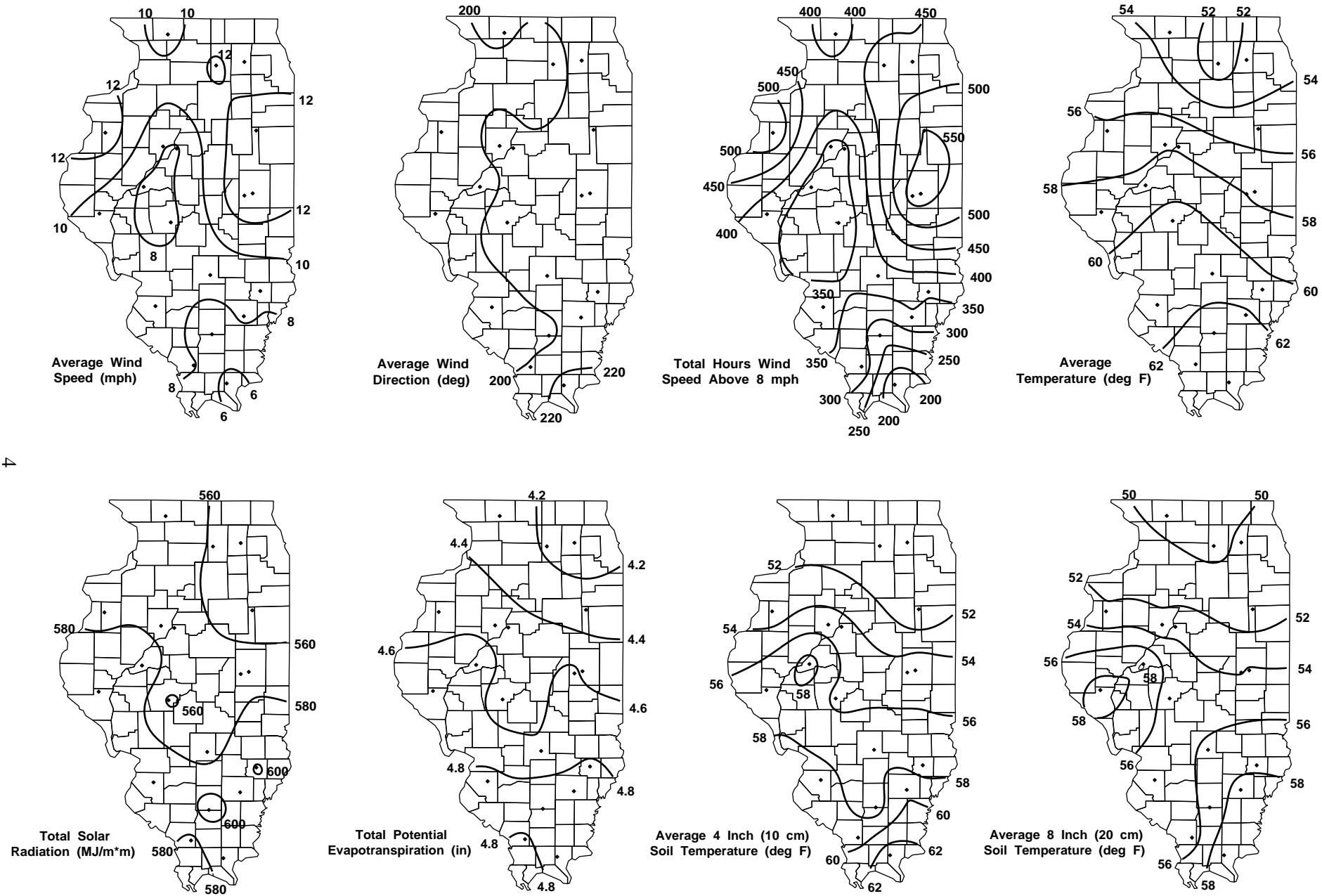


Figure 4. April monthly averages and totals as collected by the Illinois Climate Network

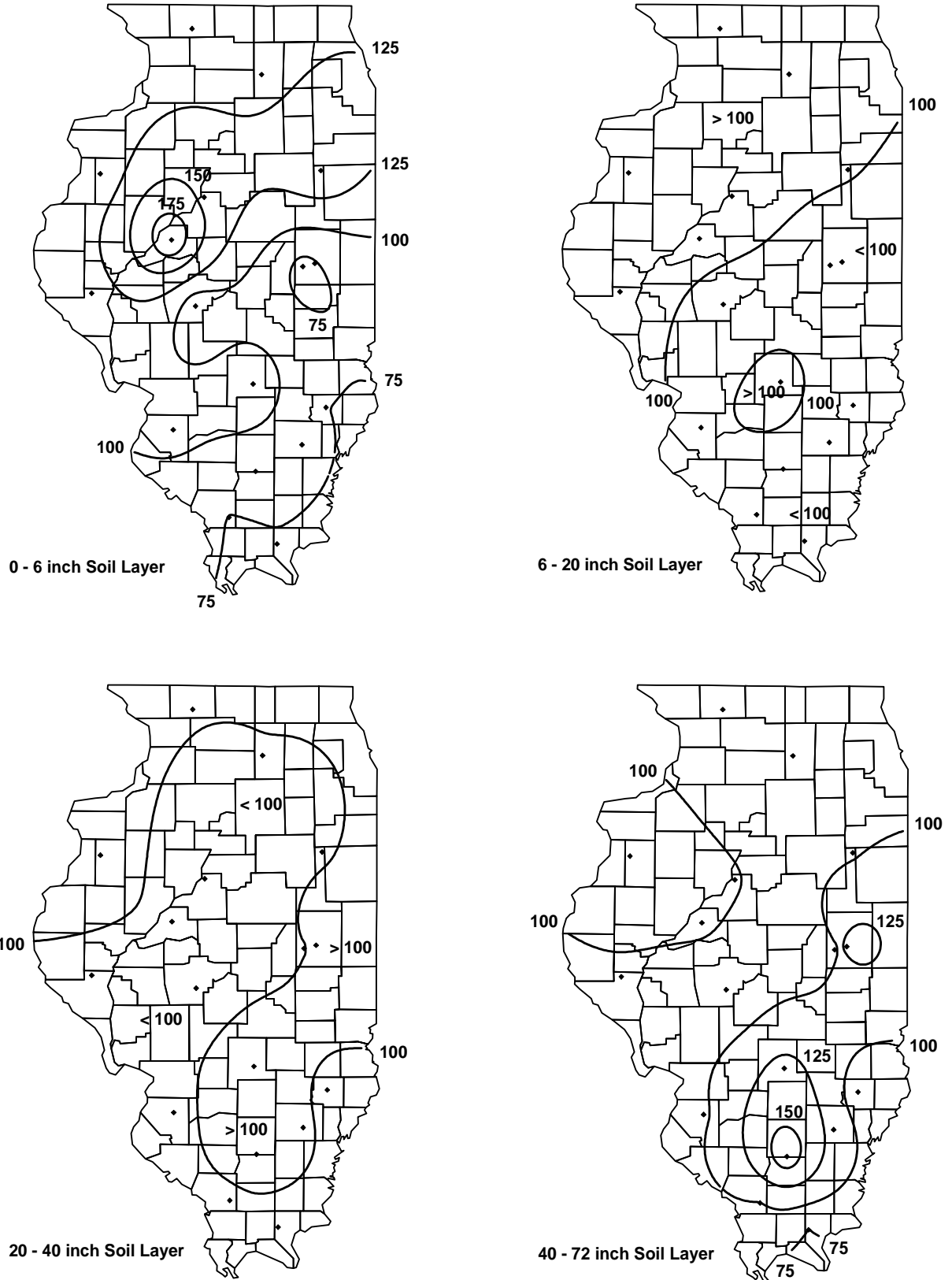


Figure 5. May 1 observed percent-of-normal soil moisture based on 1985-1995 mean

**Table 2. Soil Moisture in Various Layers on May 1, 2001**

<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)	1.9	-1	4.7	7	7.1	2
DeKalb (NE)	2.1	-13	5.1	-7	7.5	-2
Monmouth (W)	1.9	-7	4.7	1	6.7	-1
East Peoria (C)	2.1	25	5.3	4	7.8	1
Topeka (C)	1.4	29	2.7	-0	3.1	-3
Stelle (E)	2.5	20	5.5	0	6.8	-0
Champaign (E)	1.6	-19	4.8	-10	6.8	3
Bondville (E)	1.5	-27	4.4	-14	8.1	-5
Perry (WSW)	2.0	-7	5.2	-4	7.9	-3
Springfield (WSW)	1.7	-7	4.7	-6	7.7	-3
Brownstown (ESE)	2.4	-5	4.7	-6	8.5	-1
Olney (ESE)	1.8	-21	4.3	-8	7.0	-3
Belleville (SW)	2.0	-8	4.5	-8	8.3	-4
Carbondale (SW)	1.8	-30	4.3	-15	7.6	-8
Ina (SE)	1.9	-25	4.9	-6	7.7	-1
Fairfield (SE)	1.6	-34	4.8	-9	7.5	0
Dixon Springs (SE)	1.8	-24	4.6	-9	7.7	-3

Compared to one month ago, soil moisture in the 0- to 6-inch layer generally decreased statewide (Table 2). Values in southern areas decreased roughly 20 to 35 percent. Conversely, increases of about 20 to 30 percent occurred in this layer across a small region of central Illinois. Moisture decreases dominated the 6- to 20- and 20- to 40-inch layers. Changes were roughly 5 to 15 percent in the middle soil moisture layer and were less than 5 percent in the deepest layer observed.

### **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, and USACE. Provisional discharge data are obtained from direct computer access to 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 reading posted by the National Weather Service and/or USACE. The Illinois River did not exceed flood stage during April, except at Hardin, which was influenced by high stages on the Mississippi River. The peak stage at Hardin was recorded on the last day of the month.

In March, the Mississippi River above the confluence with the Illinois River did not exceed flood stage. During April, however, major flooding occurred in Illinois from Dubuque to Grafton. Governor Ryan declared ten counties along the Mississippi River disaster areas. Below the confluence with the Illinois River, the peak stage recorded at Chester exceeded flood stage. Upstream of the Quad Cities, the 1965 flood holds the peak stage record, while downstream, the 1993 flood set current peak stage records. At some Mississippi River stations along the Illinois border, the April 2001 peak stage is the second highest on record. Mississippi River stages rose during April, and peak stage was recorded during the last few days of the month. The Ohio River at Cairo did not exceed flood stage during April.

Table 4 lists 26 streamgaging stations located throughout Illinois. Provisional monthly mean flows posted by USGS are listed if available; otherwise, daily mean discharge data posted by USGS were used to estimate the mean flow for the month. Long-term mean flows for each month are published by 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.

**Table 3. Peak Stages for Major Rivers, April 2001**

<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	7.6	16
	La Salle	224.7	20	15.0	25
	Peoria	164.6	18	13.1	17
	Havana	119.6	14	12.9	01
	Beardstown	88.6	14	13.3	01
	Hardin	21.5	25	27.6	30
Mississippi	Dubuque	579.9	17	25.4	21
	Keokuk	364.2	16	20.1	27
	Quincy	325.0	17	23.4	28
	Grafton	218.0	18	22.6	30
	St. Louis	180.0	30	25.5	30
	Chester	109.9	27	27.2	28
	Thebes	43.7	33	29.6	28
Ohio	Cairo	2.0	40	37.2	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, July 1998.

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

Mean provisional flow statewide was below the median this month (85 percent of the median) and below the mean (70 percent of the mean). Relative to the median flow at each station for April, flows generally decreased from north to south. Northern Illinois flows were in the normal to above normal range for April. Central Illinois flows were normal. However, flows in southern Illinois are below normal. Many stations reported in Table 4 were missing data for April 8–10. At several stations, the missing data covers a period of high flow. Once the daily flows are estimated for the missing days at Momence and Greenview, the average for the month will likely be in the normal range.

**Water-Supply Lakes and Major Reservoirs.** Table 5 lists reservoirs in Illinois and their month-end water surface elevation, normal pool, 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 Survey staff for the current water levels. Most reservoirs listed in Table 5 serve as public water supplies with the exceptions noted in the last column.

Compared to levels at the end of March, available for 33 reservoirs, the water surface elevation at the end of April had risen at 8 reservoirs and decreased at 13 reservoirs. The reported elevation was the same as last month at 12 reservoirs. For the 34 reservoirs reporting at the end of April, 10 reservoirs had water surface levels above the normal pool (or target operating level), 10 reservoirs were at normal pool, and 14 reservoirs were below normal pool.

*Major Reservoirs.* Water levels at Carlyle Lake and Lake Shelbyville increased this month, but both reservoirs were below target levels. Rend Lake was above 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 April mean level for Lake Michigan was 576.9 feet, compared to a mean level of 577.2 feet in 2000. The long-term average lake level for April is 578.9 feet, based on 1918–1998 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 577.1 feet.

**Table 4. Provisional Mean Flows, April 2001**

<i>Station</i>	<i>Drainage area (sq mi)</i>	<i>Years of record</i>	<i>2001 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* (cfs)</i>	<i>Median (cfs)</i>			
Rock River at Rockton	6,363	65	9,686	7,395	6,715	above normal	27	27
Rock River near Joslin	9,549	57	12,600	10,890	9,898	normal	32	30
Pecatonica River at Freeport	1,326	81	1,589	1,213	1,005	above normal	23	30
Green River near Geneseo	1,003	61	1,026	1,080	960	normal	47	27
Edwards River near New Boston	445	62	1,034	546	386	above normal	17	24
Kankakee River at Momence	2,294	82	2,460	3,511	3,559	below normal	72	29
Iroquois River near Chebanse	2,091	76	2,276	3,248	3,071	normal	46	30
Fox River at Dayton	2,642	80	3,160	3,295	2,770	normal	46	30
Vermilion River at Pontiac	579	55	580	815	673	normal	56	29
Spoon River at Seville	1,636	83	1,970	1,870	1,532	normal	39	28
LaMoine River at Ripley	1,293	76	1,131	1,601	1,329	normal	54	25
Bear Creek near Marceline	349	55	214	429	324	normal	67	30
Mackinaw River near Congerville	767	51	1,090	1,075	949	normal	42	27
Salt Creek near Greenview	1,804	58	1,234	2,467	2,001	below normal	73	24
Sangamon River at Monticello	550	87	338	818	682	below normal	76	30
So. Fork Sangamon near Rochester	867	50	762	1,077	816	normal	52	26
Illinois River at Valley City	26,743	61	30,830	37,960	33,940	normal	57	30
Macoupin Creek near Kane	868	71	369	1,172	607	normal	62	30
Vermilion River near Danville	1,290	56	794	1,883	1,732	below normal	79	27
Kaskaskia River at Vandalia	1,940	30	963	2,614	2,288	normal	69	23
Shoal Creek near Breese	735	56	310	1,001	716	below normal	78	29
Embarras River at Ste. Marie	1,516	86	975	2,212	1,702	below normal	72	30
Skillet Fork at Wayne City	464	80	117	799	712	below normal	88	30
Little Wabash below Clay City	1,131	85	272	1,672	1,172	below normal	85	30
Big Muddy at Plumfield	794	85	601	1,562	1,015	below normal	74	27
Cache River at Forman	244	76	148	581	518	below normal	85	30

**Notes:**

\*As reported in U.S. Geological Survey (USGS) Water Resources Data, Illinois, Water Year 1999.

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.

Table 5. Reservoir Levels in Illinois

**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](mailto:sally@sws.uiuc.edu).**

## Ground-Water Information (Ken Hlinka)

**Comparison to Average Levels.** Shallow ground-water levels in 15 observation wells, remote from pumping centers, were below average levels for April (Table 6). Levels averaged 0.6 feet below and ranged from 3.2 feet below average to 1.4 feet above average. Below normal deviations occurred throughout most of southeastern Illinois for the second consecutive month.

**Comparison to Previous Month.** Shallow ground-water levels were below those of March 2001. Levels averaged 0.8 feet lower and ranged from 2.4 feet below to 0.5 feet above last month's level.

**Comparison to Same Month, Previous Year.** Shallow ground-water levels from the network in April were above the levels of April 2000. Levels averaged 1.2 feet higher and ranged from 3.1 feet below to 7.3 feet above levels of last year.

**Table 6. Month-End Shallow Ground-Water Level Data Sites, April 2001**

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	25.0	21.53	-0.62	-0.65	-0.03	+0.10
2	Mt. Morris	Ogle	55.0	N/A	N/A	N/A	N/A	N/A
3	Crystal Lake	McHenry	18.0	3.08	+0.54	+0.96	N/A	N/A
4	Cambridge	Henry	42.0	4.01	+1.41	+1.40	-0.12	-0.01
5	Fermi Lab	DuPage	15.0	5.63	-1.24	-1.35	-1.65	-3.05
6	Good Hope	McDonough	30.0	N/A	N/A	N/A	N/A	N/A
7	Snicarte	Mason	42.0	35.69	+0.65	+0.70	+0.49	+2.57
8	Coffman	Pike	28.0	9.71	-1.08	-1.42	-1.41	+6.80
9	Greenfield	Greene	20.70	7.31	+0.26	-0.35	-2.23	+7.27
10	Janesville	Cumberland	11.0	5.60	-1.16	-1.10	-0.35	-0.41
11	St. Peter	Fayette	15.0	3.24	-0.97	-1.01	-1.00	-1.61
12	SWS #2	St. Clair	80.0	12.94	-0.67	+0.68	-0.11	+2.73
13	Boyleston	Wayne	23.0	3.20	-0.33	-0.38	-0.46	-0.31
14	Sparta	Randolph	27.0	5.24	-1.07	-0.37	0.00	+2.49
15	SE College	Saline	10.19	5.24	-3.04	-3.24	-2.44	+0.27
16	Dixon Springs	Pope	8.63	3.75	-1.27	-1.78	-1.09	+0.31
17	Bondville	Champaign	21.0	3.71	-1.11	-0.74	-1.04	-0.10

**Note:** N/A = Information not available.

Some of the **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://mcc.sws.uiuc.edu/>

NCDC - National Climate Data Center, <http://www.ncdc.noaa.gov/>

NDMC - National Drought Mitigation Center, <http://enso.unl.edu/monitor/monitor/html>

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/>