

ILLINOIS WATER AND CLIMATE SUMMARY  
April 1998

**April 1998 Overview (Bob Scott)**

Temperatures across Illinois were near average while precipitation was above average. Soil moisture within the top 40 inches was above the long-term statewide average. Mean streamflows were above the median level. Shallow ground-water levels were above the long-term average.

**Mean temperatures** across Illinois (Figure 1) were near average for April (-0.5-degree departure). Temperatures by crop reporting districts (Table 1) ranged from 1.4 degrees below normal (southeast) to 0.8 degrees above normal (east).

**Precipitation amounts** (Figure 1) across the state during April were above the long-term mean for the fourth straight month. The statewide average of 5.02 inches represents a +1.22-inch departure or 132 percent of average. District averages (Table 1) ranged from 3.99 inches (northwest) to 7.23 inches (southeast), 115 to 169 percent of normal, respectively.

**Soil moisture** (Figure 1) in the 0- to 40-inch layer was above normal (a +1.12-inch departure) at the end of April. Nevertheless, actual soil moisture levels across much of the state decreased during the month within all layers (Table 2), especially near the surface.

**Mean provisional streamflow** (Figure 1) statewide was above the median flow (185 percent of the median). Streamflows in northern Illinois were well above normal while those in central and southern Illinois were in the normal to above normal range. Most sites along the Illinois, Mississippi, and Ohio Rivers observed peak stages that exceeded flood stage.

**Reservoir levels (water surface levels)** from 39 reporting stations at the end of April were at normal pool (target operating level) at nine reservoirs, above normal pool at 29 reservoirs, and slightly below the seasonally increased target level at one reservoir. Carlyle Lake and Lake Shelbyville ended the month near their increased summer target operating levels. Rend Lake remained several feet above normal pool. **Lake Michigan** levels continue to exceed the long-term mean.

Statewide, **shallow ground-water levels** were above average for April (a +1.7-foot departure). Greatest deviations occurred in northwestern Illinois. Levels averaged about 0.3 feet above March levels and were approximately 1.5 feet above April levels last year.

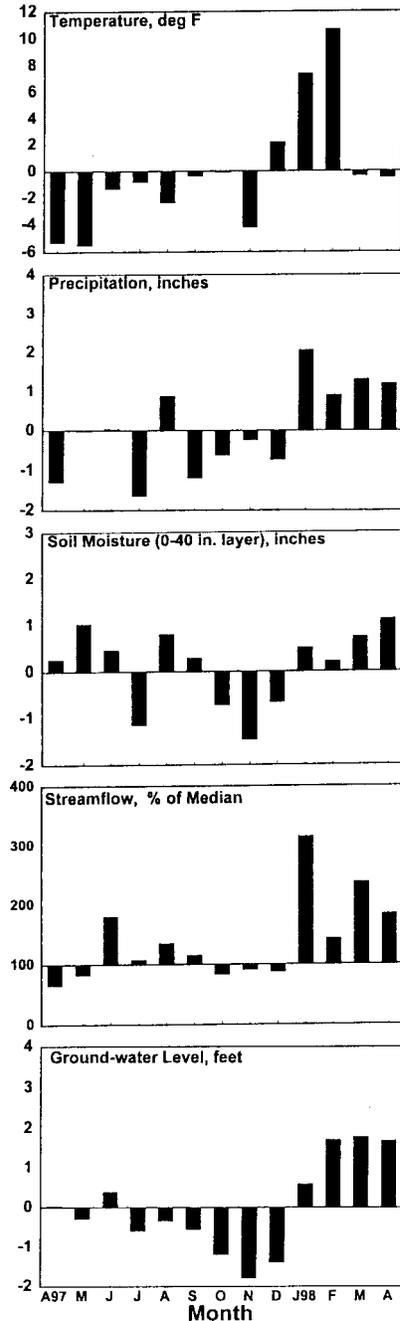


Figure 1.  
Statewide departures from normal

Note: The WARM Network maps will appear only in the January and July issues.

Contact

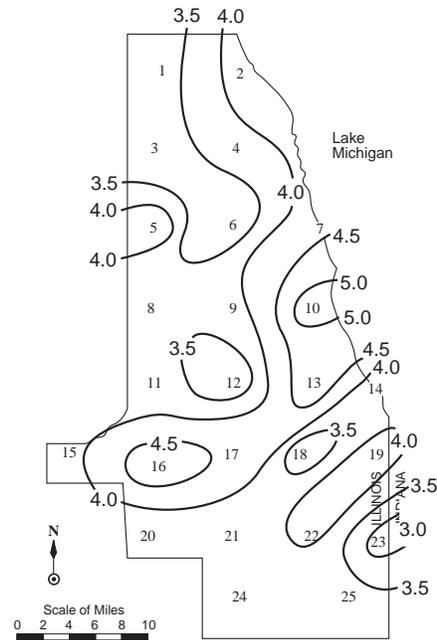
Bob Scott: (217) 333-4966, email: rscott5@uiuc.edu  
On the Web at www.sws.uiuc.edu/warm

**Weather/Climate Information (Nancy Westcott, Steve Hilberg, and Bob Scott)**

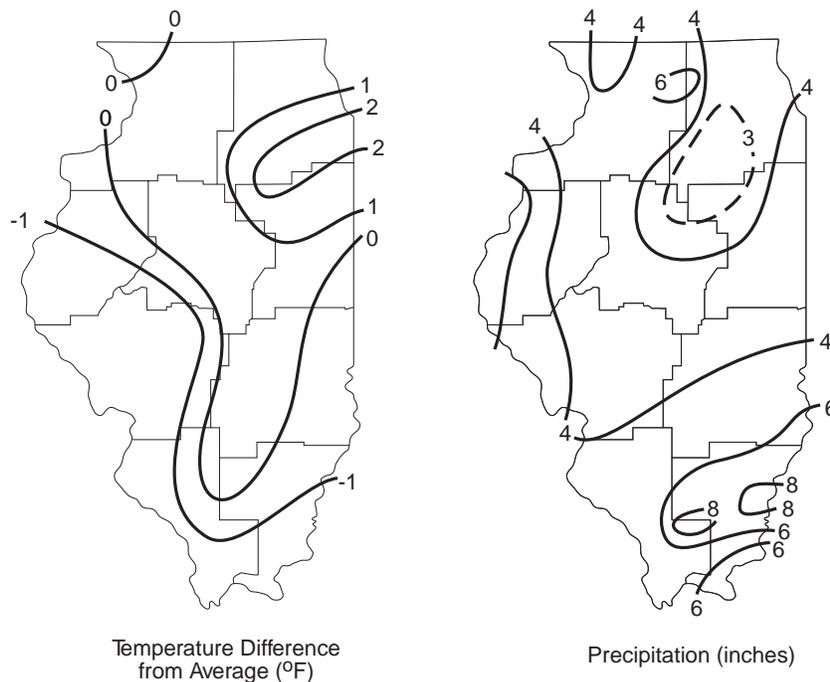
**Cook County Precipitation.** March precipitation (Figure 2) amounts were moderate to heavy. Monthly site values ranged from 5.07 inches at site #10 (26th Street) to 2.86 inches at site #3 (Lansing). Heaviest precipitation occurred in an east-west band that curved northward along Lake Michigan across the south-central portion of the network. Lightest precipitation was reported in the far southeastern corner of the network and in the northwestern region. The March 1998 network average of 3.85 inches totaled about 153 percent of the eight-year (1990 - 1997) March network average of 2.51 inches.

**April temperatures** (Figure 3) were near the long-term average across the entire state. The greatest departures from average were found in northeastern Illinois where several locations were more than two degrees warmer than average for the month. Conversely, temperatures in western and southeastern Illinois were one to one-and-a-half degrees colder than average.

**April precipitation** (Figure 3) was greater than average across most of the state for the fourth consecutive month. Heaviest rainfall totals occurred in far southeastern Illinois where maximum reported amounts exceeded 8 inches (Albion, 8.38 inches; Plumfield, 8.28 inches; and Carmi, 9.98 inches). Rainfall across the rest of Illinois was generally between 3.50 and 4.50 inches. April was an active month for severe weather across the state. On April 7, the National Weather Service documented at least 15 separate tornadoes across central and southern Illinois as well as numerous reports of hail 2 inches in diameter. One tornado injured four people near Arthur. In parts of Douglas county, hail was so deep snowplows were needed to clear some roads. Severe weather occurred again across the southern third of the state on April 13 and over central and southern Illinois on April 15. Baseball size hail fell in Baldwin in northern Randolph County and a tornado destroyed homes and reportedly derailed a 78-car freight train at Flora in Clay County. The



**Figure 2. Cook County precipitation (inches) during March 1998**



**Figure 3. Illinois precipitation and temperatures during April 1998**

**Table 1. Illinois Precipitation and Temperature by Crop Reporting District**

Crop Reporting District	Last Month			Last 3 Months			Last 6 Months			Last 12 months		
	Apr 98 Amnt	% Avg	Temp Dev	Feb 98- Apr 98	% Avg	Temp Dev	Nov 97- Apr 98	% Avg	Temp Dev	May 97- Apr 98	% Avg	Temp Dev
Northwest	3.99	115	-0.4	11.35	155	3.9	17.14	134	3.1	34.40	96	0.8
Northeast	4.52	122	0.6	9.96	129	4.6	16.35	115	3.4	33.62	93	0.8
West	4.33	120	-0.9	13.07	161	2.7	20.09	141	2.0	37.75	101	0.1
Central	4.35	116	-0.1	11.38	135	3.5	18.49	121	2.8	36.86	100	0.4
East	4.40	115	0.8	11.10	130	3.9	17.65	112	3.1	37.50	100	0.5
West-southwest	4.99	130	-1.1	13.68	152	2.4	22.51	138	2.0	37.17	98	0.3
East-southeast	5.78	148	-0.6	12.78	129	2.6	20.29	108	2.2	37.96	94	0.3
Southwest	6.16	151	-1.2	15.14	138	1.8	23.08	111	1.5	44.74	106	0.0
Southeast	7.23	169	-1.4	14.61	123	1.7	22.83	102	1.4	44.09	101	-0.2
<b>State Average</b>	<b>5.02</b>	<b>132</b>	<b>-0.5</b>	<b>12.47</b>	<b>139</b>	<b>3.1</b>	<b>19.71</b>	<b>119</b>	<b>2.4</b>	<b>37.86</b>	<b>99</b>	<b>0.4</b>

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

month ended with more isolated severe storms in central Illinois on April 29 and 30, producing large hail and a few weak tornadoes.

**Extended climate outlooks** for May issued by the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Climate Prediction Center call for equal chances of below, above, and normal temperature and precipitation over Illinois. Likewise, the May-July outlooks are also for equal chances of below, above, and normal temperature and precipitation statewide.

**Illinois Climate Network (ICN) Data.** Average daily wind speeds for April (Figure 4) ranged from 5.4 mph at Dixon Springs to 11.7 mph at Bondville. Monmouth recorded the highest wind gust for the month, 52 mph on April 12. The prevailing wind direction for April was southwesterly over southwestern Illinois, but easterly in northern Illinois, and was likely a reflection of frequent fronts over the state during the month. The frequency of winds in excess of 8 mph ranged from 149 hours at Dixon Springs to about 475 hours at Monmouth and Bondville. (April has 720 hours.) Average temperatures ranged from 50°F across northern Illinois to more than 56°F across the southern quarter of the state. Solar radiation continued its seasonal increase and totaled between 439 Mega-Joules per meter squared (MJ/m<sup>2</sup>) at Monmouth and 524 MJ/m<sup>2</sup> at Belleville. Warmer temperatures also yielded higher potential evapotranspiration. Values ranged from 3.25 inches across northern Illinois to just over 4.0 inches at Belleville and Carbondale. Soil temperatures at both the 4- and 8-inch levels continued to warm and ranged from near 50°F in northern Illinois to the mid- to upper 50s in southeastern Illinois.

### Soil Moisture Information (Bob Scott)

Soil moisture conditions at the end of April were above normal in the near-surface layer over much of western Illinois and close to normal in deeper layers statewide. Rainfall totals across Illinois during the month were adequate to keep moisture conditions above normal in the 0- to 6-inch layer (Figure 5). Over the western two-thirds of the state, amounts exceeded 125 percent of normal (values at Peoria exceeded 200 percent of normal). Conditions in far eastern Illinois were near normal. In the 6- to 20-inch layer, above normal conditions existed in scattered regions of the state with near normal conditions elsewhere.

Concurrently, data from the 20- to 40-inch layer indicated near normal conditions statewide. Normal conditions were also reported in the 40- to 72-inch layer over most of the state, but some areas in the eastern third of the state remained dry. Throughout the first 40 inches of soil, statewide soil moisture conditions (Figure 1) were above the 1985-1995, 11-year average for May 1.

Despite the areas of above normal soil moisture conditions, actual moisture amounts decreased at nearly all sites in every layer (Table 2). Decreases were greatest in the 0- to 6-inch layer, especially across central Illinois where values were 10 to 20 percent lower. Most sites in the far north and far south reported only small changes. This same pattern was found in the 6- to 20-inch layer, but with smaller extremes. In the 20- to 40-inch layer, moisture amounts decreased during the month, but by no more than 8 percent.

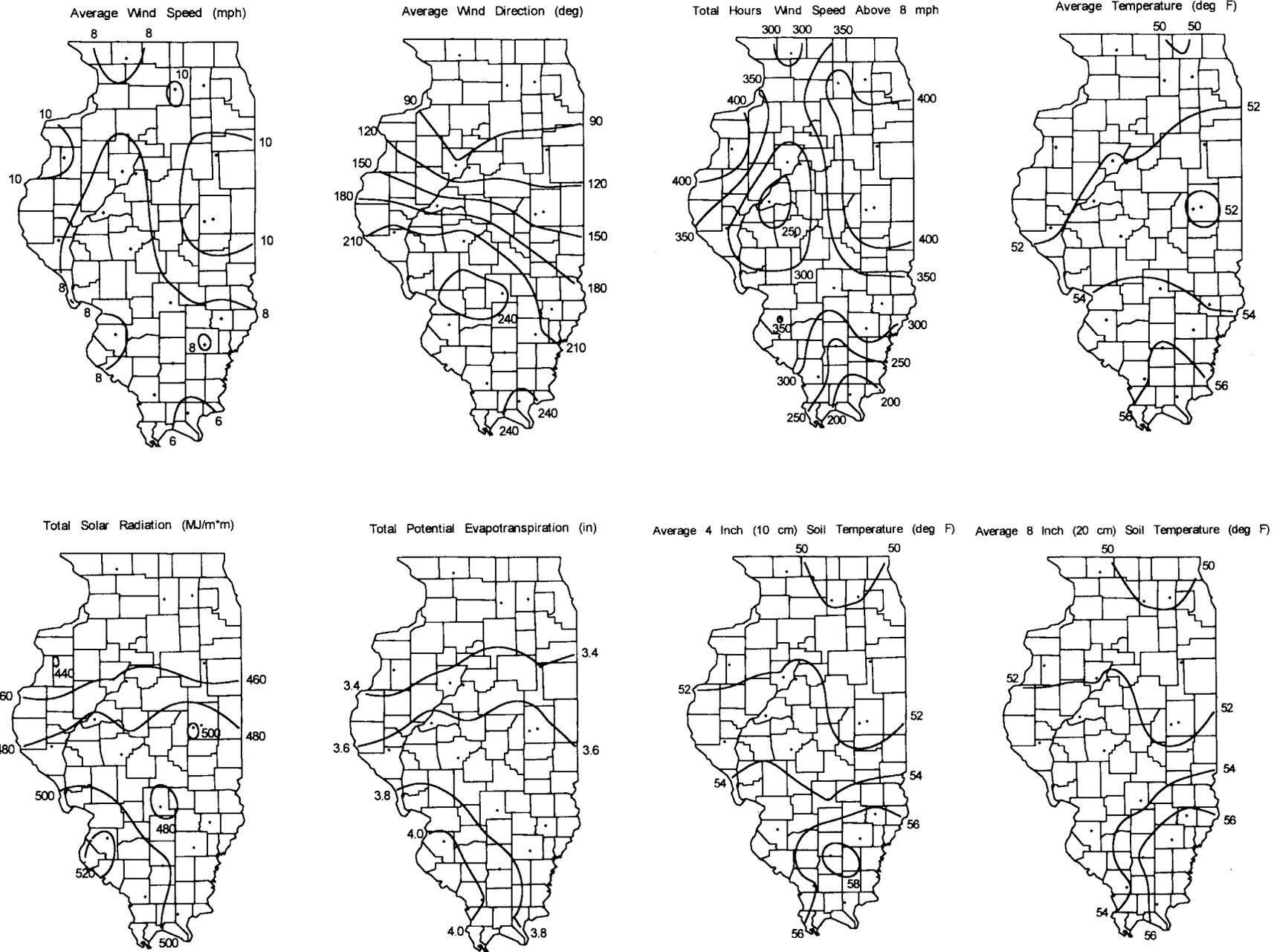


Figure 4. April monthly averages and totals as collected by the Illinois Climate Network

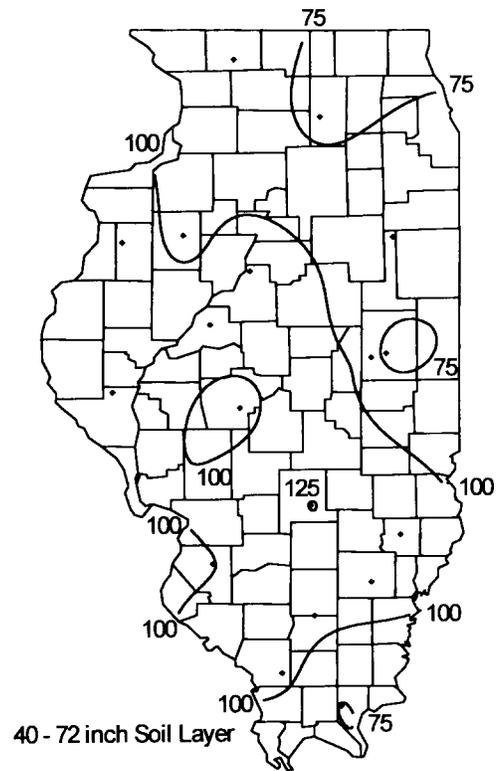
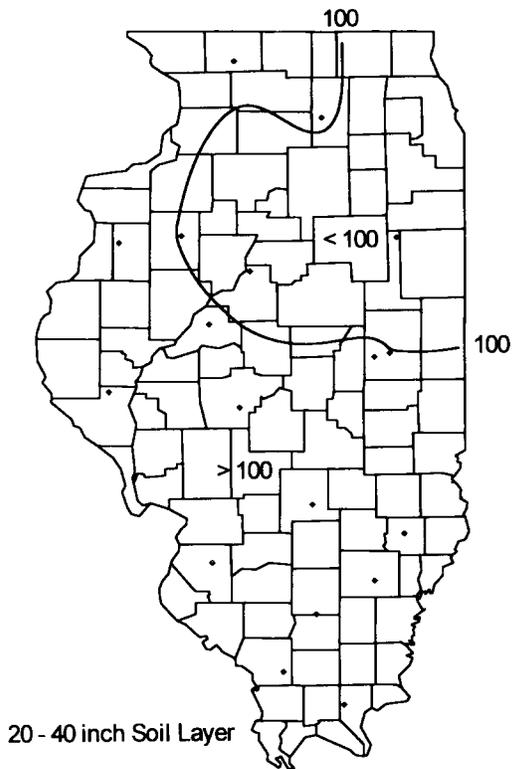
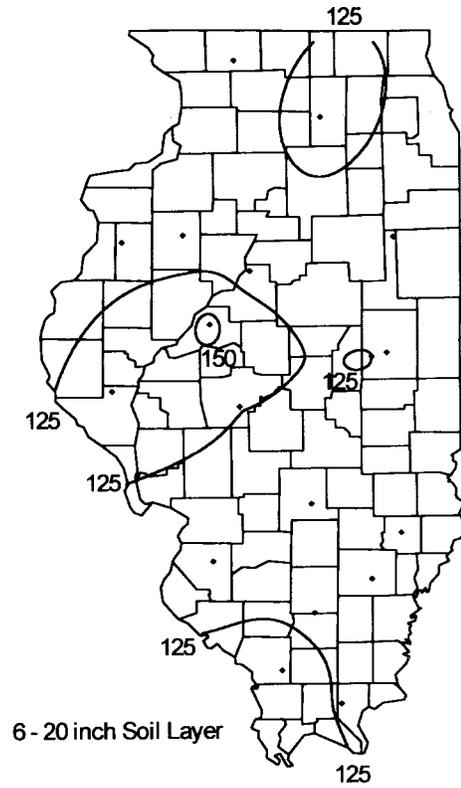
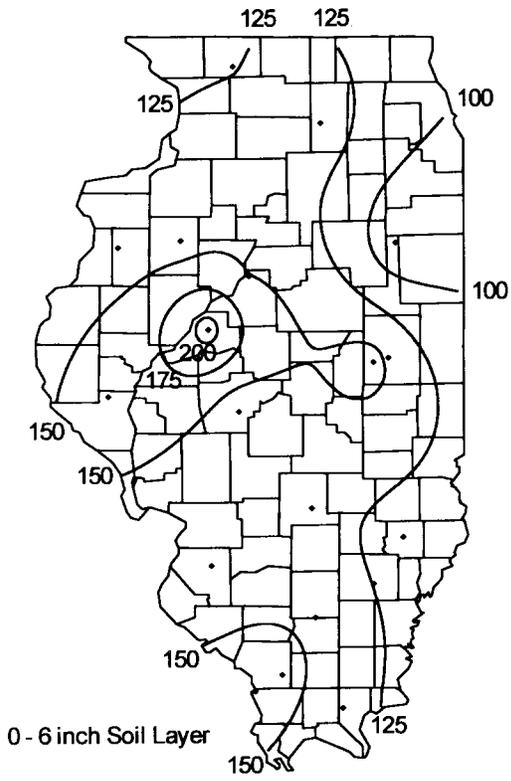


Figure 5. May 1 observed percent-of-normal soil moisture based on 1985-1992 mean

**Table 2. Soil Moisture in Various Layers on May 1, 1998**

<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)	2.1	5	4.5	2	7.1	2
DeKalb (NE)	2.4	5	6.0	12	7.5	0
Monmouth (W)	2.2	-11	4.7	-8	6.8	-4
Oak Run (W)	2.4	-16	4.8	-11	8.0	-5
East Peoria (C)	2.2	-18	5.2	-5	7.9	-5
Topeka (C)	1.5	17	3.1	11	3.2	6
Stelle (E)	1.7	-44	5.5	-2	6.4	-6
Champaign (E)	2.4	-4	5.1	-11	6.4	-8
Bondville (E)	2.7	-11	5.6	-4	8.3	0
Perry (WSW)	2.5	-6	5.6	-3	8.3	4
Springfield (WSW)	2.2	-4	5.3	-3	8.2	-0
Brownstown (ESE)	2.5	-6	4.5	-11	8.1	-5
Olney (ESE)	2.4	-17	4.8	-4	7.3	0
Belleville (SW)	2.5	-3	5.2	-8	8.7	-3
Carbondale (SW)	3.3	1	6.0	-1	8.2	-1
Ina (SE)	2.7	1	5.3	-2	7.6	-1
Fairfield (SE)	2.6	1	5.6	1	7.5	-0
Dixon Springs (SE)	2.9	21	5.7	11	8.3	0

**Surface Water Information (Sally McConkey)**

River and stream discharge and stage data are obtained from gaging stations equipped with telemetry. Most stations are operated and maintained by the U. S. Geological Survey (USGS) and supported in part by the U.S. Army Corps of Engineers, Illinois Department of Natural Resources Office of Water Resources, and the Illinois State Water Survey. Provisional data are obtained from either direct computer access to the USGS or posted by the National Weather Service.

**Rivers and Streams.** Values reported in the provisional data do not reflect final or official stages or discharges. Table 3 lists streamgaging stations located on the Illinois, Mississippi, and Ohio Rivers. The peak stage is determined from the daily morning reading posted by the National Weather Service.

Peak stages on the Illinois River were again above flood stage this month and at most stations occurred during the first week of April. Peak stages at reporting stations along the Mississippi and Ohio Rivers also exceeded flood stage but during the third week of the month. Stages at all sites declined throughout the rest of the month.

Table 4 lists 18 streamgaging stations located throughout Illinois. Provisional mean monthly flows posted by USGS are listed if available; otherwise, daily discharge data posted by the USGS were used to estimate the mean flow for the month. Each month the long-term mean flows are published by USGS; these data represent the average, period-of-record flow each month at every station. The month's median flow listed in Table 4 is determined by ranking each site's monthly mean flow for each year of record, and selecting the middle value. The current's month flow condition (above normal to below normal) is determined on the basis of its rank relative to the historical record for the month. The terms describing flow condition are defined in the notes following Table 4.

Throughout most of Illinois, streamflows were in the normal to much above normal range. Stations in northwestern Illinois recorded flows in the above normal to much above normal range. In central Illinois, stations on the Vermilion River at Pontiac, the Mackinaw River near Congerville, and the Sangamon River at Monticello recorded flows in the normal range. In southern Illinois, Shoal Creek near Breese and the Skillet Fork at Wayne City recorded flows in the normal range. Elsewhere, across this region, April's average flows were in the above 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. Normal pool elevation is the elevation of the spillway crest unless releases are controlled and/or adjusted to meet target operating levels. Water withdrawals from public water-supply reservoirs are reported for the previous month as available. Most

**Table 3. Peak Stages for Major Rivers, April 1998**

<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	12.6	10.8	03
	La Salle	224.7	20	21.5	01
	Peoria	164.6	18	22.2	01
	Havana	119.6	14	19.5	02
	Beardstown	88.6	14	21.5	01
	Meredosia	71.3	14	20.6	05
	Hardin	21.5	25	31.6	17
Mississippi	Dubuque	579.9	17	18.5	10
	Keokuk	364.2	16	18.9	16
	Quincy	325	17	23.3	15
	Grafton	218	18	25.8	17
	St. Louis	180	30	33.2	17
	Chester	109.9	26.9	35.1	18
	Thebes	43.7	33	38.2	20
Ohio	Cairo	2.0	40	51.2	22

**Notes:**

\*River mile and flood stage from *River Stages in Illinois: Flood and Damage Data*, Illinois Department of Transportation, Division of Water Resources, May 1994.

\*\*Peak stages based on daily a.m. reading, not hourly data.

**Table 4. Provisional Mean Flows, April 1998**

<i>Station</i>	<i>Drainage area (sq mi)</i>	<i>Years of record</i>	<i>1998 mean flow (cfs)</i>	<i>Long-term flows</i>		<i>Flow condition</i>	<i>Days of data this month</i>	<i>Percent chance of exceedence</i>
				<i>Mean* (cfs)</i>	<i>Median (cfs)</i>			
Rock River at Rockton	6,363	62	12,310	7,288	6,655	above normal	30	14
Rock River near Joslin	9,549	54	18,320	10,720	9,587	above normal	29	13
Pecatonica River at Freeport	1,326	79	2,719	1,196	1,005	much above normal	30	04
Green River near Geneseo	1,003	58	2,043	1,059	959	above normal	30	12
Edwards River near New Boston	445	59	1,231	534	372	above normal	30	10
Kankakee River at Momence	2,294	79	5,550	3,490	3,558	above normal	29	10
Fox River at Dayton	2,642	80	4,071	3,280	2,743	above normal	30	29
Vermilion River at Pontiac	579	53	662	825	664	normal	30	55
Spoon River at Seville	1,636	80	3,317	1,847	1,513	above normal	30	17
LaMoine River at Ripley	1,293	73	2,988	1,577	1,197	above normal	30	20
Mackinaw River near Congerville	767	48	1,112	1,082	938	normal	30	38
Sangamon River at Monticello	550	84	930	824	679	normal	30	36
Vermilion River near Danville	1,290	53	1,978	1,892	1,703	above normal	29	29
Kaskaskia River at Vandalia	1,940	27	4,712	2,658	2,577	above normal	30	14
Shoal Creek near Breese	735	53	1,288	1,013	693	normal	30	35
Embarras River at Ste. Marie	1,516	83	3,161	2,221	1,678	above normal	30	26
Skillet Fork at Wayne City	464	77	1,055	795	701	normal	30	32
Big Muddy at Plumfield	794	82	1,900	1,522	989	above normal	28	23

**Notes:**

\*As reported in U.S. Geological Survey (USGS) Water Resources Data, Illinois, Water Year 1994.

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).**

of the reservoirs listed in Table 5 serve as public water supplies, with exceptions noted in the last column.

Compared to levels at 39 reporting stations at the end of March, water surface elevation at the end of April had risen at 25 reservoirs, remained the same at nine, and decreased at five. Reports at the end of April revealed that 29 reporting stations were above the spillway crest or target operating level, nine stations were at normal pool, and levels at Lake Decatur were being increased to accommodate the summer target operating pool (effective in May).

*Major Reservoirs.* Efforts to bring reservoir levels to summer target operating levels continued during April at Carlyle Lake and Lake Shelbyville. By the end of April, Carlyle Lake was at target pool (2 feet higher than winter target levels), and the level at Lake Shelbyville was 0.2 feet above target level. The water level at Rend Lake increased 1.7 to 5.7 feet above normal pool.

**Great Lakes.** Current month mean and end-of-month values are provisional and are relative to IGLD 1985. The April mean level for Lake Michigan was 580.34 feet compared to a mean level of 580.54 feet in 1997. The long-term average lake level for April is 578.87 feet, based on data from 1918-1996. Historically, the lowest mean level for Lake Michigan in April occurred in 1964 at 576.15 feet, and the highest level occurred in 1986 at 581.46 feet. The month-end level of Lake Michigan was 580.37 feet.

### Ground-Water Information (Bryan Coulson)

**Comparison to Average Levels.** Shallow ground-water levels in 17 observation wells remote from pumping centers were above average for April (Table 6). Levels averaged approximately 1.7 feet higher and ranged from 2.01 feet below to 13.7 feet above average levels for the month. The greatest deviation occurred in northwestern Illinois.

**Comparison to Previous Month.** Statewide, shallow ground-water levels during April 1998 were above those of March. Levels averaged approximately 0.3 feet above and ranged between 3.3 feet below and 11.9 feet above those of the previous month. The greatest deviations above the average ground-water levels occurred in the northwestern part of the state as illustrated by the observation well in Ogle County, which was approximately 11.9 feet above last month's reported level.

**Comparison to Same Month, Previous Year.** Shallow ground-water levels this month were above those of April 1997. Levels averaged about 1.5 feet above normal and ranged from 2.0 feet below to 12.8 feet above those one year ago.

**Table 6. Month-End Shallow Ground-Water Level Data Sites, April 1998**

Number	Well name	County	This month's reading (depth to water, feet)	Deviation from		
				Avg. level (feet)	Previous month (feet)	Previous year (feet)
1	Galena	JoDaviess	20.00	+1.06	+1.10	+1.10
2	Mt. Morris	Ogle	4.00	+13.71	+11.90	+12.80
3	Crystal Lake	McHenry	3.39	+0.69	+2.42	+0.17
4	Cambridge	Henry	3.46	+2.14	-1.27	+2.32
5	Fermi Lab	DuPage	3.21	+1.60	-0.96	+3.66
6	Good Hope	McDonough	NA	NA	NA	NA
7	Snicarte	Mason	36.67	-0.30	+1.24	+0.60
8	Middletown	Logan	1.78	+1.16	-0.08	+1.01
9	Coffman	Pike	4.51	+3.73	-3.11	+0.45
10	Greenfield	Greene	5.50	+1.37	-2.68	+2.63
11	Janesville	Cumberland	4.82	-0.36	-1.06	+0.85
12	St. Peter	Fayette	4.23	-2.01	-3.21	-2.02
13	SWS #2	St. Clair	13.26	+0.37	+0.06	-0.43
14	Boyleston	Wayne	2.44	+0.41	-0.70	+0.03
15	Sparta	Randolph	3.57	+1.30	-2.56	+0.02
16	SE College	Saline	1.46	+0.39	+1.00	0.00
17	Dixon Springs	Pope	0.72	+1.21	+1.85	+1.37

**Note:** Effective this month, the Swartz well in Piatt County is no longer an observation well.