

## ILLINOIS WATER AND CLIMATE SUMMARY March 1998

### March 1998 Overview (Bob Scott)

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

**Mean temperatures** across Illinois (Figure 1) were near average for March (a -0.4-degree departure), ending a 2-month interval of exceptionally warm conditions. Temperatures by crop reporting districts (Table 1) ranged from 1.3 degrees above normal (northeast) to 1.4 degrees below normal (west-southwest).

**Precipitation amounts** (Figure 1) across the state during March were above the long-term mean for the third straight month. The statewide average of 4.75 inches represents a +1.33-inch departure or 139 percent of average. District averages (Table 1) ranged from 3.59 inches (northeast) to 5.56 inches (southwest). On average, totals were heavier in the northwest (174 percent of the average for the month) while precipitation in the southeast reached only 90 percent of the mean.

**Soil moisture** (Figure 1) in the 0- to 40-inch (0- to 100-cm) layer at the end of March was above normal (a +0.73-inch departure). Soil moisture levels increased during the month in the near surface layer across much of the state (Table 2) with little change within deeper layers.

**Mean provisional streamflow** (Figure 1) statewide was much above the median flow (239 percent of median). Streamflows throughout Illinois were well above the normal range with the exception of stations on the Rock River, Fox River, and the Big Muddy where recorded flows were in the normal range. Peak stages exceeded flood stage at stations along the Illinois River, the Mississippi River below the Illinois River confluence, and on the Ohio River at Cairo.

**Reservoir levels (water surface levels)** for 43 reporting stations at the end of March were at normal pool (target operating level) at 12 reservoirs, above normal pool at 30 reservoirs, and below normal pool at one reservoir. Carlyle Lake and Lake Shelbyville ended March well above target operating levels. Rend Lake is also above normal pool.

**Lake Michigan** levels continue to exceed the long-term mean.

Statewide, **shallow ground-water levels** were above average for March (a 1.8-foot departure). Greatest deviations occurred in the western part of the state. Levels averaged about 1.0 foot above those of last month and were approximately 1.5 feet above March levels one year ago.

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

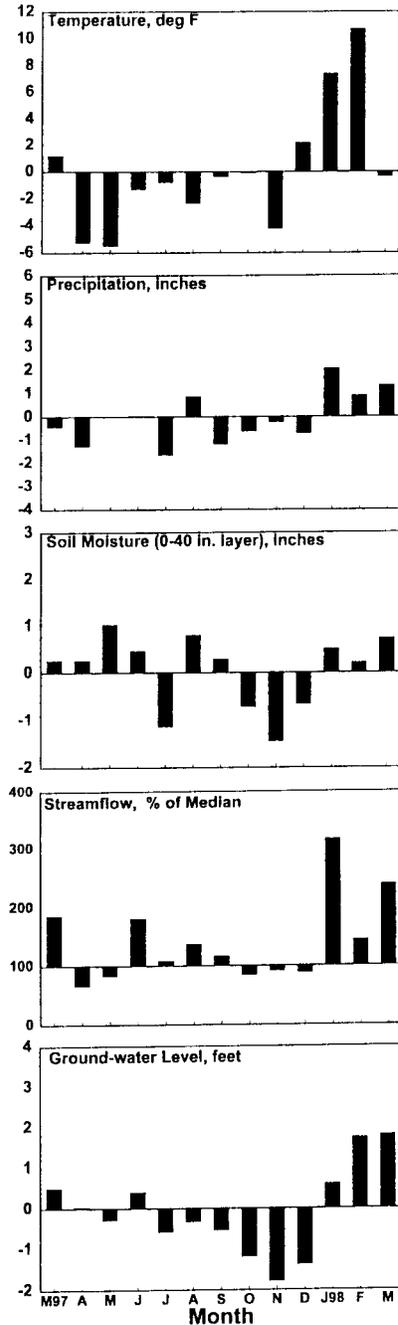


Figure 1.  
Statewide departures from normal

### Contact

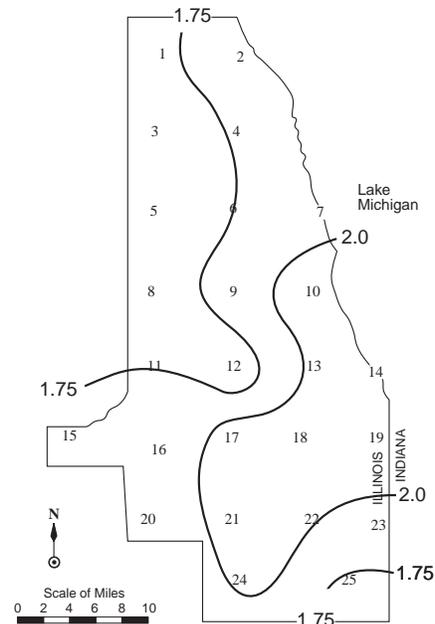
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**Weather/Climate Information (Nancy Westcott, Steve Hilberg, and Bob Scott)**

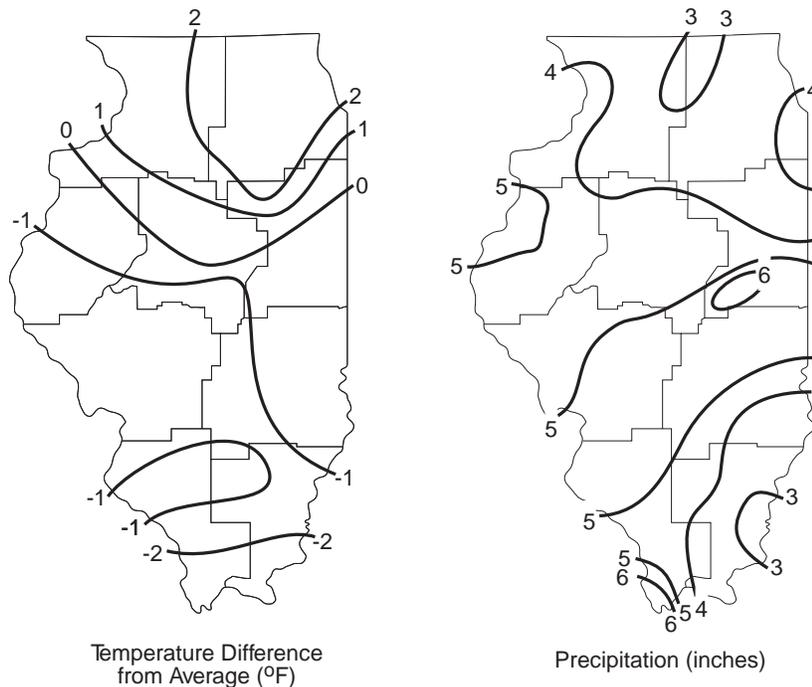
**Cook County Precipitation.** February precipitation (Figure 2) amounts were fairly uniform across the network and close to the February network average. Site values for the month ranged from 2.19 inches at site #19 (Avenue O) to 1.57 inches at site #3 (Des Plaines). Slightly heavier precipitation was found in the southern portion of the network, and the lightest precipitation was in the west-central and northwestern regions of the network. The February 1998 network average of 1.87 inches was about 90 percent of the eight-year (1990 - 1997) February network average of 2.09 inches.

**Temperatures** during March (Figure 3) were slightly above average in northeastern Illinois and near to below average elsewhere. However, periods of temperature extremes dominated each half of the month. For the first 15 days of March, the statewide average temperature was 30.8°F, 7.6 degrees below normal. On March 12, low temperatures were generally 10°F or lower throughout Illinois with near-record lows occurring in central Illinois [Champaign, 4°F (record tied); Quincy, 1°F; and Springfield, -1°F (new record)]. Temperatures reversed completely during the last half of the month as the statewide average temperature was 49.5°F, 6.3 degrees above average (Table 1). During the last week of March, maximum temperatures reached the upper 70s and low 80s throughout the state.

For the third straight month, statewide **precipitation** (Figure 3) was above normal. Several major storms affected Illinois during March. On March 8, storms moving through the Midwest brought heavy snow to northern Illinois and moderate to heavy rain over much of the central sections. Snow spread into east-central Illinois the next day. Some snowfall amounts from this storm included: 12.0 inches (Peotone), 9.0 inches (Romeoville), 6.5 inches



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



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

**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. 98 Amount	% Avg.	Temp. Dev.	Jan. 98- Mar. 98	% Avg.	Temp. Dev.	Oct. 97- Mar. 98	% Avg.	Temp. Dev.	Apr. 97- Mar. 98	% Avg.	Temp. Dev.
Northwest	4.73	174	0.6	9.83	192	6.4	15.03	123	3.2	32.45	91	0.5
Northeast	3.59	130	1.3	8.63	156	6.8	14.21	108	3.3	31.37	87	0.5
West	5.08	161	-1.0	11.35	192	5.1	17.93	131	2.1	36.35	97	-0.2
Central	4.46	141	-0.3	9.76	157	6.1	16.17	113	2.8	34.63	94	0.0
East	5.02	161	0.0	9.48	149	6.5	15.24	104	2.9	34.85	93	0.0
West-southwest	5.37	159	-1.4	11.78	173	5.3	19.40	126	2	34.03	90	0.0
East-southeast	4.74	123	-0.8	10.05	125	5.6	16.45	92	2	34.19	85	0.0
Southwest	5.56	129	-1.2	12.47	136	4.7	19.54	100	1.7	41.70	99	-0.3
Southeast	4.17	90	-1.0	10.55	103	4.8	17.90	85	1.5	40.36	92	-0.5
<b>State Average</b>	<b>4.75</b>	<b>139</b>	<b>-0.4</b>	<b>10.40</b>	<b>150</b>	<b>5.7</b>	<b>16.81</b>	<b>108</b>	<b>2.5</b>	<b>35.17</b>	<b>92</b>	<b>0.0</b>

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

(Hoopston), 4.7 inches (Urbana), and 3.2 inches (Lincoln). On March 19-20, an intense winter storm moving in from the Central Plains spread rain into the southern two-thirds of the state with 1 to 2 inches being recorded. Snow fell along the northern edge with totals ranging from 2 to 5 inches. Another intense storm system spawned severe thunderstorms from western to east-central Illinois overnight on March 27-28. A tornado touched down in Mattoon on March 28, destroying nine homes, two businesses, and injuring three people.

**Extended climate outlooks** issued by the U.S. Department of Commerce, National Atmospheric and Oceanic Administration, Climate Prediction Center for April are for equal chances of below, above, and normal temperature and precipitation over all of Illinois. The April-June outlooks indicate a slight chance of below normal temperatures across the southern half of the state and below normal precipitation in Illinois' northernmost tier of counties. Elsewhere, temperature and precipitation outlooks call for equal chances of below, above, and normal conditions.

**Illinois Climate Network (ICN) Data.** Average daily wind speeds for March (Figure 4) ranged from 6.8 mph at Dixon Springs to 13.2 mph at Monmouth. Orr recorded the highest wind gust for the month, 61 mph on March 27. The prevailing wind direction during the month was from southwesterly to westerly over the southern three-quarters of the state, but northerly in far northern Illinois. The frequency of winds in excess of 8 mph ranged from 261 hours at Dixon Springs to about 565 hours at Monmouth. (March has 744 hours.) Average temperatures ranged from about 38°F at Monmouth and Freeport in northwestern Illinois to about 45°F across the southern quarter of the state. Solar radiation increased substantially during March compared to February due to less frequent cloud cover and the seasonal shift to longer daytime hours. Totals ranged from 340 Mega-Joules per meter squared (MJ/m<sup>2</sup>) at St. Charles to about 396 MJ/m<sup>2</sup> at Belleville. Potential evapotranspiration ranged from 2.1 inches at St. Charles and Freeport to nearly 2.6 inches at Belleville. Soil temperatures at both the 4- and 8-inch levels became more seasonal and ranged from the upper 30s in northern Illinois to the upper 40s in southeastern Illinois.

### Soil Moisture Information (Bob Scott)

Soil moisture conditions near the surface at the end of March were slightly above normal over most of Illinois and close to normal in deeper layers. In the 0- to 6-inch layer (Figure 5), a broad region of the state reported moisture conditions in excess of 125 percent of normal. Areas in far northern and far southern Illinois observed near normal moisture conditions. Near normal moisture was also observed throughout the 6- to 20- and 20- to 40-inch layers across the entire state. Concurrently, data from 40 to 72 inches of depth continued to show a more variable moisture layer. Conditions were slightly above normal from northwestern to southeastern Illinois while most of the remainder of the state reported near normal conditions. Only far northeastern Illinois observed moisture amounts that were slightly below normal. Throughout the first 40 inches of depth, current statewide soil moisture conditions (Figure 1) are above the 1985-1995, 11-year average for April 1.

Soil moisture levels increased during March at nearly all sites in the 0- to 6-inch layer (Table 2), especially across the central part of the state where increases ranged from 20 to 35 percent of totals last month. Most sites in the far north and south reported only small changes. In the 6- to 20-inch layer, soil moisture increased slightly during March across central Illinois at levels near 10 percent. At the same time, moisture in the 20- to 40-inch layer re-

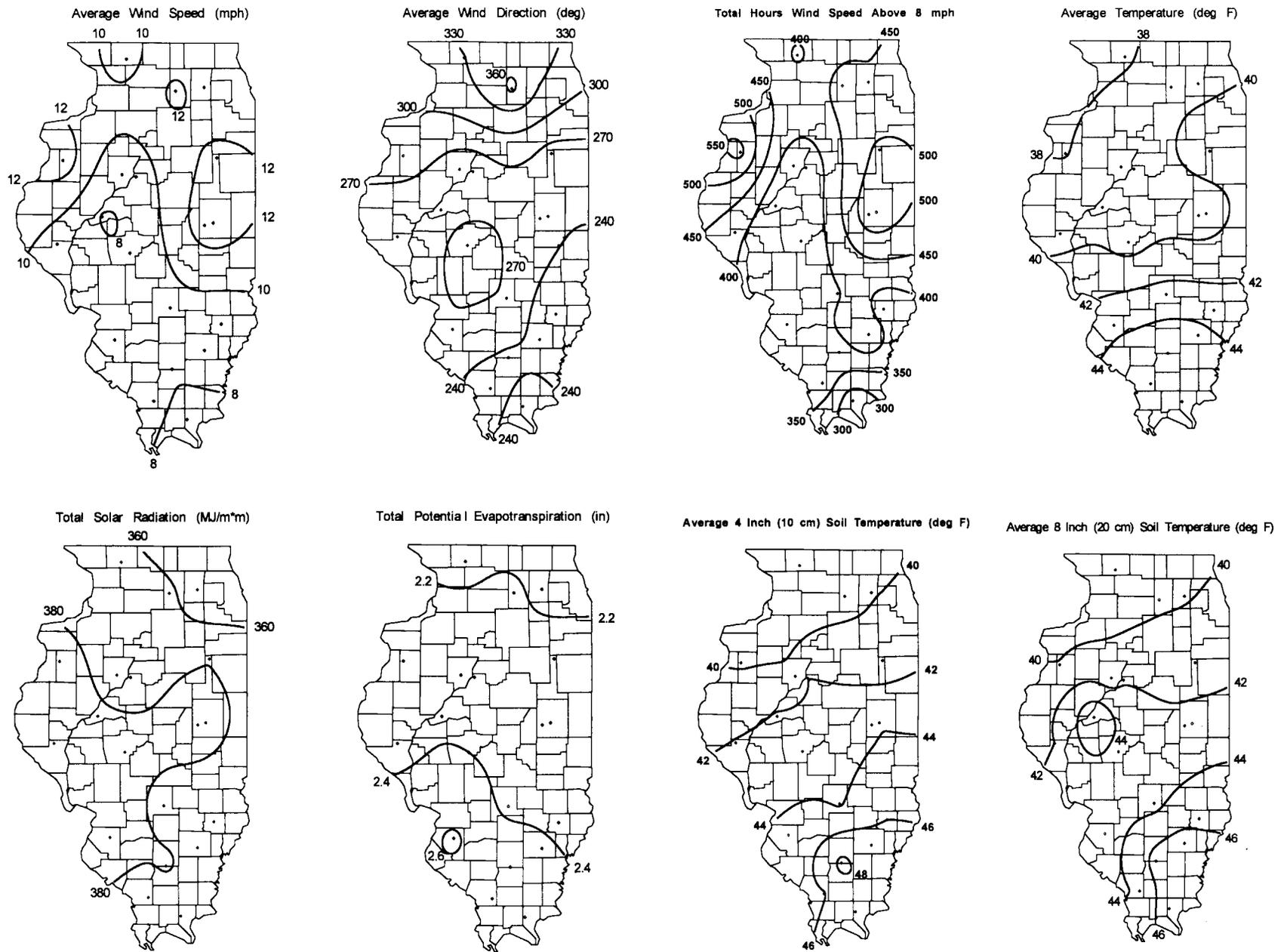


Figure 4. March monthly averages and totals as collected by the Illinois Climate Network

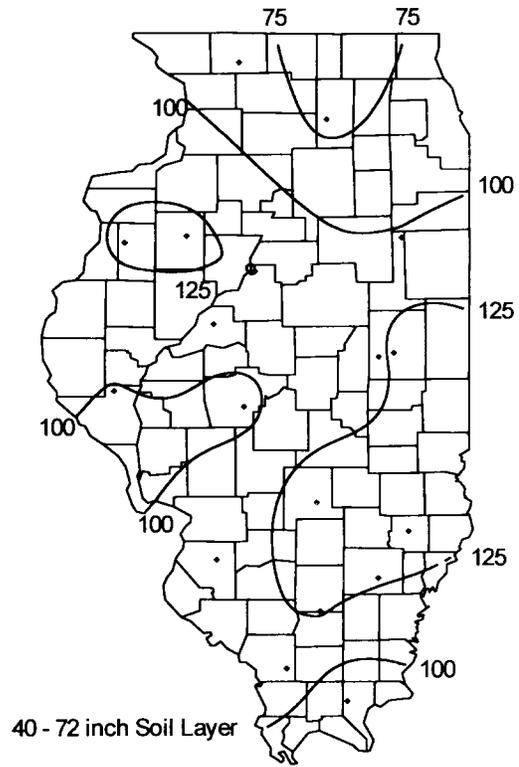
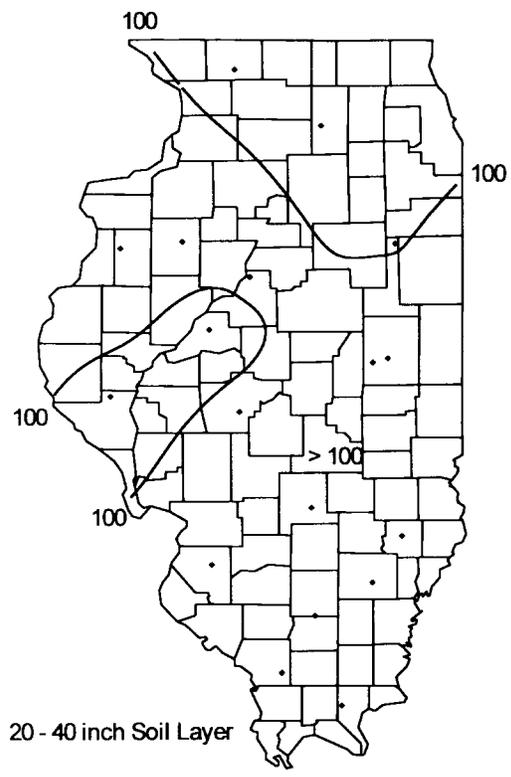
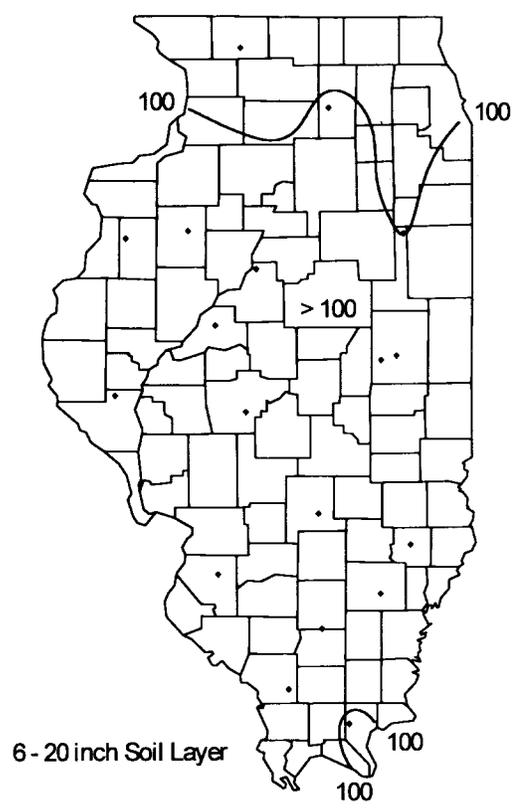
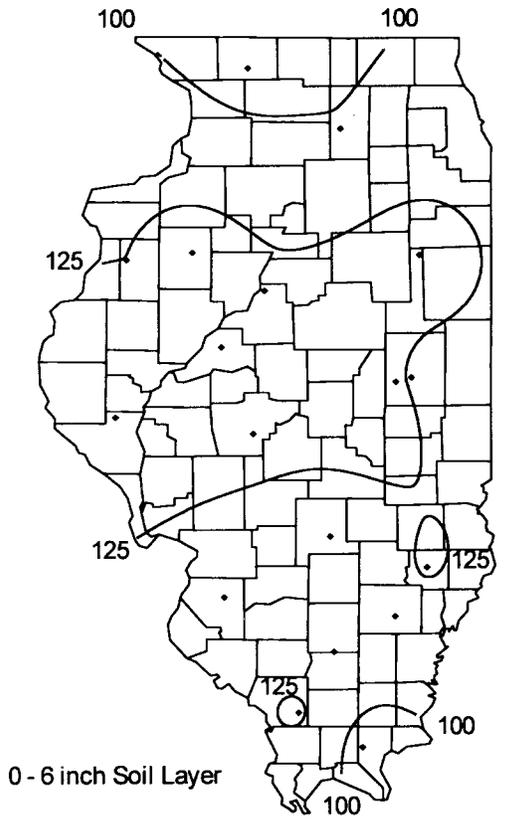


Figure 5. April 1 observed percent-of-normal soil moisture based on 1985-1992 mean

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

<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	-7	4.4	-0	6.9	1
DeKalb (NE)	2.3	3	5.3	-5	7.5	2
Monmouth (W)	2.5	16	5.1	7	7.1	4
Oak Run (W)	2.8	25	5.3	9	8.4	2
East Peoria (C)	2.7	8	5.4	3	8.3	2
Topeka (C)	1.3	15	2.8	-2	3.0	-4
Stelle (E)	3.1	31	5.5	2	6.8	4
Champaign (E)	2.5	1	5.7	9	7.0	8
Bondville (E)	3.0	24	5.8	11	8.3	1
Perry (WSW)	2.7	18	5.7	1	8.0	-3
Springfield (WSW)	2.3	12	5.5	3	8.2	-0
Brownstown (ESE)	2.6	-1	5.1	-2	8.6	2
Olney (ESE)	2.8	17	5.0	1	7.3	0
Belleville (SW)	2.6	4	5.6	3	9.0	0
Carbondale (SW)	3.2	23	6.0	6	8.3	1
Ina (SE)	2.7	4	5.4	1	7.7	0
Fairfield (SE)	2.6	-3	5.5	-2	7.5	-0
Dixon Springs (SE)	2.4	-2	5.2	-2	8.3	-1

mained virtually unchanged with observed differences of less than 5 percent at most sites.

### 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, the 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.** Data are provisional, and values reported 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.

Every station along the Illinois River recorded stages above flood stage starting at Morris where the peak stage for the month was recorded on March 20 and continuing downstream to Hardin where the peak stage was recorded on March 30. Along the Mississippi River from Grafton to the confluence with the Ohio River, peak stage was above flood stage. The Ohio River at Cairo likewise recorded a peak stage above flood stage. In general, peak stages were recorded during the later part of the month and were slowly declining at most stations at month's end.

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. Long-term mean flows for each month published by the USGS are the average flow that month for the entire period of record at that station. The month's median flow for each station listed in Table 4 is determined by ranking the month's mean flow for each year of record and selecting the middle value. The current month's 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. (**Note:** In previous years, the current month's mean flow at each station was computed as a percentage of the long-term *mean* flow for the month, and Figure 1 presented the average of the computed percentages. Beginning with the January 1998 issue, the current month's flow is now computed as a percent of the *median* flow for the month at each station, and Figure 1 presents the average of the computed percentages of median flow.)

Throughout most of Illinois, streamflows in March were in the high normal to much above normal range. Stations on the Rock River, Fox River, and Big Muddy River recorded average flows in the normal range for March.

**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

**Table 3. Peak Stages for Major Rivers, March 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	17.9	20
	La Salle	224.7	20	24.7	21
	Peoria	164.6	18	22.1	25
	Havana	119.6	14	20.5	26
	Beardstown	88.6	14	22.1	27
	Meredosia	71.3	14	20.8	28
	Hardin	21.5	25	27.8	30
Mississippi	Dubuque	579.9	17	12.9	09
	Keokuk	364.2	16	11.6	10
	Quincy	325	17	15.3	10
	Grafton	218	18	19.9	22
	St. Louis	180	30	29.5	22
	Chester	109.9	26.9	31.8	23
	Thebes	43.7	33	35.3	24
Ohio	Cairo	2.0	40	44.6	26

**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, March 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	6055	7285	7967	normal	31	66
Rock River near Joslin	9,549	54	10,500	10,830	10,002	normal	31	48
Pecatonica River at Freeport	1,326	79	2761	1784	1722	above normal	31	19
Green River near Geneseo	1,003	58	1508	1032	853	above normal	31	20
Edwards River near New Boston	445	59	1026	497	411	much above normal	31	10
Kankakee River at Momence	2,294	79	5719	3238	3113	much above normal	31	05
Fox River at Dayton	2,642	80	2777	3299	2685	normal	31	49
Vermilion River at Pontiac	579	53	1811	732	357	much above normal	31	07
Spoon River at Seville	1,636	80	4872	1625	1165	much above normal	31	05
LaMoine River at Ripley	1,293	73	3631	1302	869	much above normal	31	07
Mackinaw River near Congerville	767	48	2284	932	684	much above normal	31	14
Sangamon River at Monticello	550	84	1861	698	589	much above normal	31	06
Vermilion River near Danville	1,290	53	3878	1686	1446	much above normal	30	09
Kaskaskia River at Vandalia	1,940	27	5487	2990	2057	above normal	31	21
Shoal Creek near Breese	735	53	2271	972	803	above normal	31	11
Embarras River at Ste. Marie	1,516	83	3557	2165	1887	above normal	31	21
Skillet Fork at Wayne City	464	77	1033	781	729	above normal	31	25
Big Muddy at Plumfield	794	82	1139	1286	1076	normal	31	48

**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).**

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

Compared to available data from the end of February for 41 reservoirs, the water surface elevation at the end of March rose at 20 reservoirs, remained the same at 14, and decreased at seven. Of the 43 reservoirs reporting this month, 30 were above the spillway crest or target operating level, 12 were at normal pool, and one was below normal pool at the end of March.

*Major Reservoirs.* Water levels at two lakes (Carlyle and Shelbyville) increased several feet since the end of February. The water level at Rend Lake also increased since then and was 2.2 feet above normal pool at the end of March.

**Great Lakes.** Current month mean and end-of-month values are provisional and are relative to IGLD 1985. The March mean level for Lake Michigan was 579.85 feet. The long-term average lake level for March is 578.58 feet, based on data from 1918-1995. Historically, the lowest mean level for Lake Michigan in March occurred in 1964 at 576.05 feet, and the highest level occurred in 1986 at 581.10 feet. The month-end level of Lake Michigan was 580.05 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 March (Table 6). Levels averaged 1.8 feet above normal and ranged from 1.5 feet below to 7.9 feet above average levels for the month. The greatest deviations above normal levels occurred in western Illinois. Data were not available for the Swartz well (Piatt County).

**Comparison to Previous Month.** Statewide, shallow ground-water levels during March were above those of last month. Levels averaged 1.0 feet above and ranged from 0.9 feet below to 5.0 feet above those recorded for February. This is a typical response for shallow ground-water levels to be higher than the previous month during the spring months due to increased rainfall events (i.e., ground-water recharge).

**Comparison to Same Month, Previous Year.** Shallow ground-water levels during March 1998 were above those of March 1997. Levels averaged 1.5 feet above normal and ranged from 2.3 feet below to 6.6 feet above those of one year ago.

**Table 6. Month-End Shallow Ground-Water Level Data Sites, March 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	21.10	+0.44	+0.95	- 0.13
2	Mt. Morris	Ogle	15.90	+3.28	+1.40	+0.90
3	Crystal Lake	McHenry	5.81	- 1.16	- 0.07	NA
4	Cambridge	Henry	2.19	+4.66	- 0.51	+5.17
5	Fermi Lab	DuPage	2.25	+2.04	+2.07	+4.25
6	Good Hope	McDonough	2.42	+4.67	+0.58	+6.60
7	Snicarte	Mason	37.91	- 1.09	+0.87	-0.24
8	Middletown	Logan	1.70	+1.44	+0.21	+0.31
9	Swartz	Piatt	NA	NA	NA	NA
10	Coffman	Pike	1.40	+7.89	+5.02	+5.41
11	Greenfield	Greene	2.82	+4.50	+2.87	+3.11
12	Janesville	Cumberland	3.76	+0.76	+0.75	+1.43
13	St. Peter	Fayette	1.02	+0.78	0.00	+0.26
14	SWS #2	St. Clair	13.32	+0.77	- 0.07	-0.42
15	Boyleston	Wayne	1.74	+0.52	- 0.09	+0.35
16	Sparta	Randolph	1.01	+3.83	+3.27	+1.39
17	SE College	Saline	2.46	- 1.46	- 0.86	- 2.27
18	Dixon Springs	Pope	2.57	- 1.10	- 0.10	- 1.54