

## ILLINOIS WATER AND CLIMATE SUMMARY February 1998

### February 1998 Overview (Bob Scott)

Temperatures across Illinois in February were the warmest on record, and precipitation was above average. Soil moisture within the top 40 inches was near the long-term statewide average. Mean streamflows were above the median. Shallow ground-water levels were above the long-term average.

**Mean temperatures** across Illinois during February (Figure 1) were much above average (+10.7-degree departure). Temperatures by crop reporting districts (Table 1) ranged from 7.9 degrees above average (southeast) to 12.3 degrees above average (northern Illinois).

**Precipitation amounts** (Figure 1) across the state averaged above the long-term mean value for February. The statewide average of 2.69 inches represents a +0.91-inch departure or 151 percent of average. District averages (Table 1) ranged from 1.62 inches (east) to 3.62 inches (west), 102 to 265 percent of normal, respectively.

**Soil moisture** (Figure 1) in the 0- to 40-inch (0- to 100-cm) layer at the end of February was near normal (a +0.21-inch departure). Soil moisture levels decreased across much of the state during the month in the near surface layer (Table 2) with little change within deeper layers.

**Provisional streamflow** (Figure 1) statewide was 144 percent of the median. In previous issues, the flow at each station was computed as a percentage of the long-term *mean* flow for the month. Starting with the January 1998 issue, however, the current month's flow at each station is being computed as a percent of the *median* flow for the month.

Streamflows were similar to those in January and were generally above the median flow in northern and central Illinois and near the median flow across southern Illinois. Two stations on the Illinois River peaked above flood stage. Stages recorded at stations along the Mississippi River were rising at the end of the month. The Ohio River at Cairo peaked just below flood stage.

**Reservoir levels (water surface levels)** at the end of February for 40 reporting stations were at normal pool (target operating level) at 11 reservoirs, below normal pool at five stations, and above normal pool at 24 stations. Lake Carlyle was slightly above the target operating level, Lake Shelbyville was 2.6 feet above target, and Rend Lake was 1.7 feet above normal pool. **Lake Michigan** levels continue to exceed the long-term mean.

Statewide, **shallow ground-water levels** were above average for February (a +1.7-foot departure). Greatest deviations occurred in north-western Illinois. Levels averaged about 1.8 feet above those of last month and were approximately 0.3 feet below February levels one year ago.

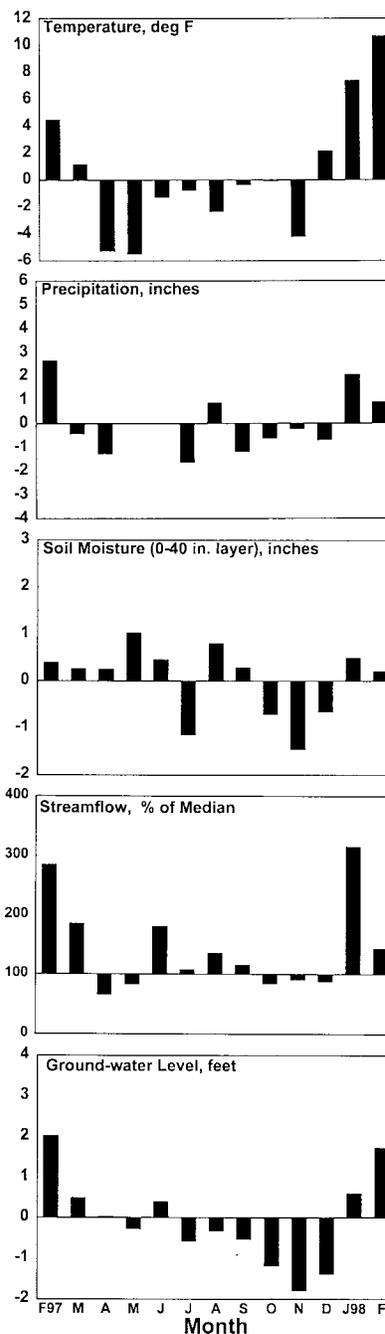


Figure 1.  
Statewide departures from average

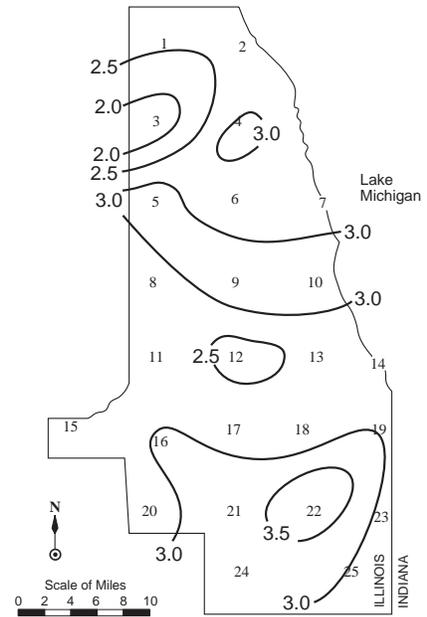
Note: The WARM Network maps will appear only in the January and July issues.

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

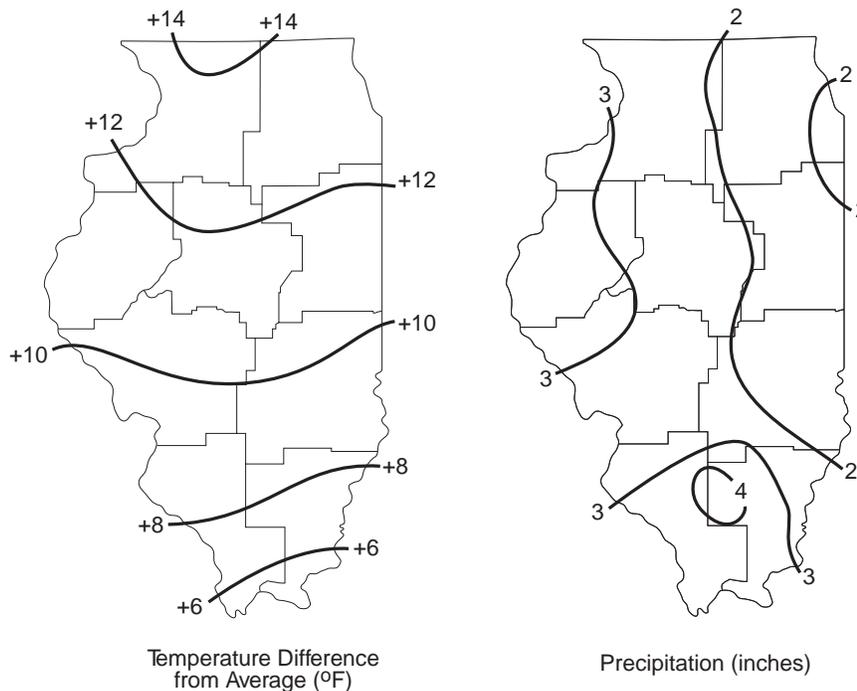
**Cook County Precipitation.** January amounts (Figure 2) were moderate. Site values for the month ranged from 3.70 inches at site #22 (Harvey) to 1.89 inches at site #3 (Des Plaines). Precipitation was heaviest in the southern portion of the network and lightest in central and northwestern regions. The January 1998 network average of 2.83 inches was about 130 percent of the eight-year (1990-1997) January network average of 2.20 inches.

February **temperatures** (Figure 3) across Illinois were much above average for the month. Readings ranged from 6 degrees above average in far southern Illinois to more than 14 degrees above average in the north. This was the warmest February on record (dating back to 1895) in Illinois with a statewide mean temperature of 39.7°F (Table 1). Winter 1997-1998 (December-February) was the second warmest on record with a mean temperature of 34.4°F. There were no days with temperatures below zero. Coldest weather during the month occurred on February 6-7 when low temperatures dropped into the teens across northern Illinois (17°F in Mt. Carroll). Temperatures rose into the 60s throughout most of the state during the last week of the month, with the warmest weather on February 26 (Rockford, 61°F; Urbana, 64°F; and Fairfield, 67°F).

For the second straight month statewide **precipitation** (Figure 3) was well above average. February is usually second only to January as the driest month of the year. Precipitation was near average in the east and east-southeast crop reporting districts but more than 200 percent of average in the northwest and west districts. The only measurable snowfall occurred on February 28 in northwestern Illinois (Moline, 0.5 inches). Winter precipitation (December-February) was near average in eastern, southeastern, and far southern Illinois, and above average elsewhere.



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



**Figure 3. Illinois precipitation and temperatures during February 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		
	Feb. 98 Amount	% Avg.	Temp. Dev.	Dec. 97- Feb. 98	% Avg.	Temp. Dev.	Sep. 97- Feb. 98	% Avg.	Temp. Dev.	Mar. 97- Feb. 98	% Avg.	Temp. Dev.
Northwest	2.65	231	12.3	6.69	153	7.4	12.83	97	3.1	29.02	81	0.6
Northeast	1.84	143	12.3	6.60	130	7.6	12.60	89	3.0	29.15	81	0.4
West	3.62	265	10.5	8.19	166	6.1	14.53	98	2.3	33.52	90	0.0
Central	2.58	171	11.7	6.90	123	7.1	14.51	97	2.8	32.38	88	0.2
East	1.62	102	11.8	5.99	100	7.5	12.36	83	2.8	32.43	87	0.2
West-southwest	3.25	181	10.4	8.54	138	6.3	16.51	106	2.5	31.19	83	0.2
East-southeast	2.22	102	9.7	7.30	96	6.3	13.59	79	2.3	33.44	83	0.2
Southwest	3.49	134	8.4	8.98	105	5.3	16.18	87	1.8	40.38	96	0.0
Southeast	3.24	110	7.9	8.57	91	5.2	15.77	82	1.6	41.97	96	-0.3
<b>State Average</b>	<b>2.69</b>	<b>151</b>	<b>10.7</b>	<b>7.48</b>	<b>119</b>	<b>6.6</b>	<b>14.26</b>	<b>91</b>	<b>2.5</b>	<b>33.23</b>	<b>87</b>	<b>0.2</b>

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

**Extended weather outlooks** are issued by the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Climate Prediction Center. Outlooks for both March and for March-May call for equal chances of above, below, and normal temperatures across Illinois, but for a slight chance of below normal precipitation across the state, especially over eastern counties.

**Illinois Climate Network (ICN) Data.** Average daily wind speeds for February (Figure 4) ranged from 5.0 mph at Dixon Springs to 10.1 mph at Bondville. Stelle recorded the highest wind gust for the month, 48 mph on February 26. The prevailing wind direction was from the east to northeast over the northern three-quarters of the state, but from the west in far southwestern counties. The frequency of winds in excess of 8 mph ranged from 144 hours at Dixon Springs to about 360 hours at Monmouth and DeKalb. (February has 672 hours.) Average temperatures ranged from the upper 30s in northwestern Illinois to about 43°F across the southern quarter of the state. Substantial cloud cover continued to restrict solar radiation during the month. Totals ranged from 171 Mega-Joules per meter squared (MJ/m<sup>2</sup>) at Monmouth to about 240 MJ/m<sup>2</sup> in southeastern counties. Potential evapotranspiration varied little across the state, ranging from just over an inch in northwestern Illinois to nearly 1.6 inches in the far southeast. Soil temperatures at both the 4- and 8-inch levels continued to be high for the time of year and ranged from the upper 30s (northern Illinois) to the middle 40s (far southern Illinois).

### Soil Moisture Information (Bob Scott)

Soil moisture conditions (Figure 5) at the end of February were in the normal range over most of Illinois. Only Champaign reported conditions slightly above normal in the 0- to 6-inch layer. For the remainder of the state, and over the entire state in the 6- to 20- and 20- to 40-inch layers, soil moisture conditions were within 25 percent of normal. Soil moisture was more variable in the 40- to 72-inch layer. Conditions were slightly above normal over east-central to southeastern Illinois as well as in a few northwestern counties. Slightly below normal conditions existed in a small region of north-central Illinois. Soil moisture totals in all regions of extremes ranged from 30 to 40 percent of normal. Overall, current statewide soil moisture conditions are very near the 1985-1995, 11-year average for March 1 (Figure 1). Soil moisture levels decreased during February at nearly all sites in the 0- to 6-inch layer (Table 2), especially across central Illinois where decreases ranged from 20 to 35 percent of last month's moisture totals. Increases occurred at only a few southern sites. Moisture changes in deeper layers were small. Except for moderate increases at DeKalb and Brownstown in the 6- to 20-inch layer, changes at all other sites in this layer and the 20- to 40-inch layer were less than 10 percent. Indeed, at nearly two-thirds of the stations, differences were less than 5 percent.

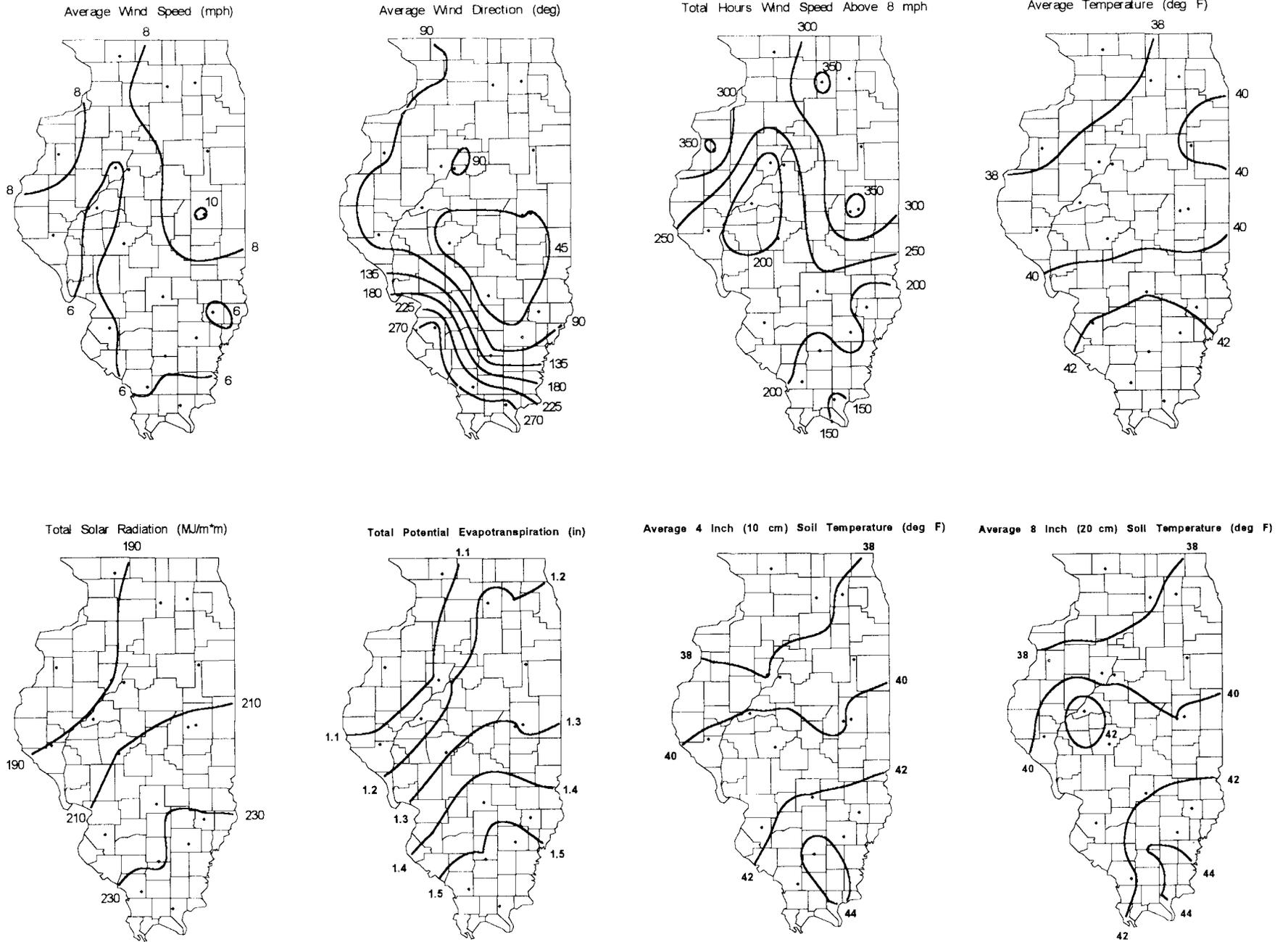


Figure 4. February monthly averages and totals as collected by the Illinois Climate Network

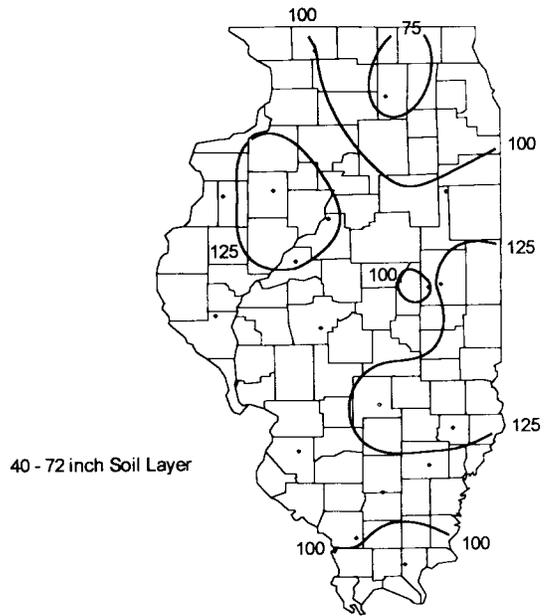
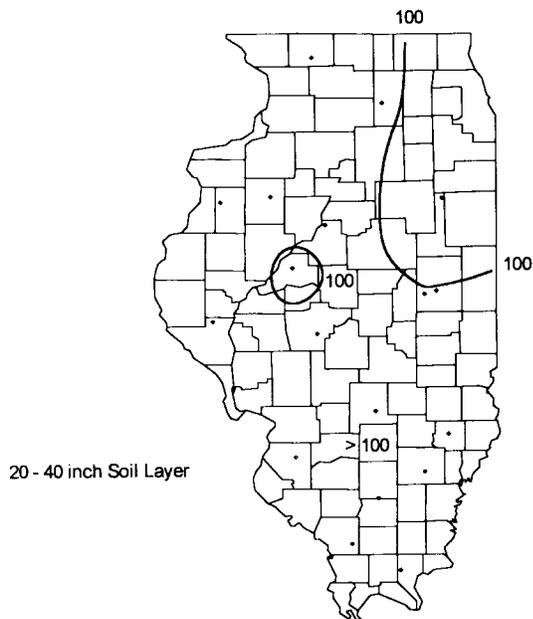
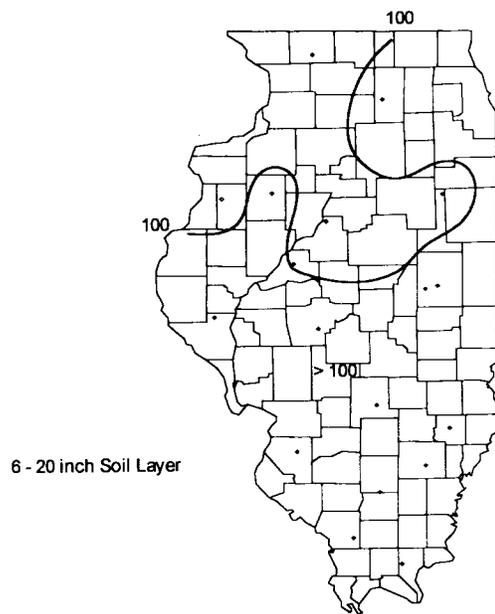
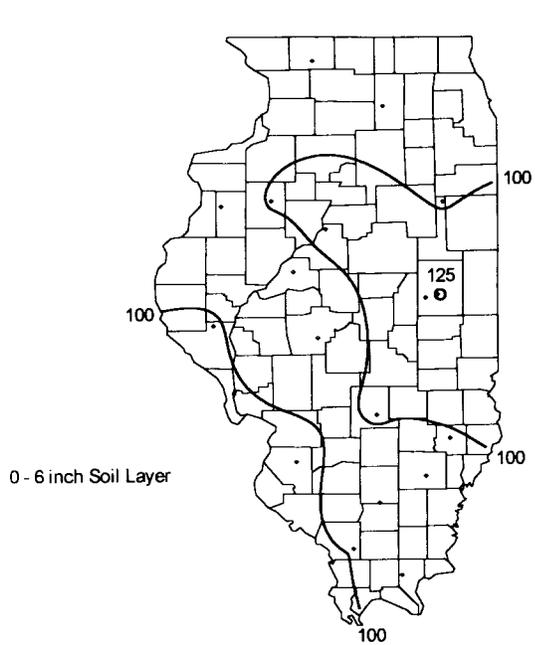


Figure 5. March 1 observed percent-of-normal soil moisture based on 1985-1995 data

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

<i>Location</i>	<i>Mar. 1 0 - 6 (inches)</i>	<i>Change from Feb. 1 (%)</i>	<i>Mar. 1 6 - 20 (inches)</i>	<i>Change from Feb. 1 (%)</i>	<i>Mar. 1 20 - 40 (inches)</i>	<i>Change from Feb. 1 (%)</i>
Freeport (NW)	2.1	-12	4.4	2	6.9	0
DeKalb (NE)	2.2	-5	5.6	19	7.4	-0
Monmouth (W)	2.1	-35	4.8	-2	6.8	-1
Oak Run (W)	2.3	-18	4.9	2	8.3	1
East Peoria (C)	2.5	-9	5.3	-7	8.2	2
Topeka (C)	1.1	-24	2.9	5	3.1	-4
Stelle (E)	2.4	-21	5.4	-3	6.6	-6
Champaign (E)	2.5	-2	5.3	-3	6.5	-3
Bondville (E)	2.5	-3	5.3	1	8.2	1
Perry (WSW)	2.3	-17	5.6	0	8.3	8
Springfield (WSW)	2.1	-12	5.3	1	8.2	3
Brownstown (ESE)	2.7	18	5.2	13	8.5	1
Olney (ESE)	2.4	-11	4.9	-0	7.2	-0
Belleville (SW)	2.5	3	5.5	9	9.0	7
Carbondale (SW)	2.6	-6	5.7	-6	8.2	1
Ina (SE)	2.5	-6	5.4	1	7.6	0
Fairfield (SE)	2.6	-4	5.6	1	7.5	-0
Dixon Springs (SE)	2.4	2	5.3	-1	8.4	3

**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.

**Rivers and Streams.** 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. Data are provisional, and values reported do not reflect final or official stages or discharges.

Two stations along the Illinois River recorded stages above flood stage. At month's end, river stage was rising at stations below Havana. The Mississippi River remained below flood stage, but river stage was rising at reporting stations at the end of the month. The Ohio River at Cairo also peaked just below flood stage on February 19.

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

Throughout northern and central Illinois, streamflows in February were in the high normal to much above normal range. Similar to last month, flows in the Kankakee, Fox, Edwards, Spoon, and LaMoine Rivers were above normal. Flows were in the normal range in southern Illinois.

**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 reservoirs listed in Table 5 serve as public water supplies; exceptions are noted in the last column.

Compared to available data from the end of January for 40 reservoirs, the water surface elevation at the end of February rose at 29 reservoirs, remained the same at nine, and decreased at two. Some reservoirs received precipitation near month's end. Of the 40 reservoirs reporting this month, 24 were above the spillway crest or target operating level (11 by only 0.1 feet), 11 were at normal pool, and five were below normal pool at the end of

**Table 3. Peak Stages for Major Rivers, February 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	10.6	13
	La Salle	224.7	20	18.8	13
	Peoria	164.6	18	14.9	21
	Havana	119.6	14	14.5	24
	Beardstown	88.6	14	14.4	28
	Meredosia	71.3	14	13.2	28
Mississippi	Hardin	21.5	25	23.5	28
	Dubuque	579.9	17	10.5	28
	Keokuk	364.2	16	8.6	28
	Quincy	325	17	12.0	13
	Grafton	218	18	16.7	28
	St. Louis	180	30	20.2	28
	Chester	109.9	26.9	21.2	28
	Thebes	43.7	33	24.6	21
Ohio	Cairo	2.0	40	39.4	19

**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, February 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	4142	3699	3269	normal	28	34
Rock River near Joslin	9,549	54	7054	6103	5427	normal	28	38
Pecatonica River at Freeport	1,326	79	1031	1105	904	normal	28	42
Green River near Geneseo	1,003	58	1116	713	655	above normal	28	25
Edwards River near New Boston	445	59	683	342	299	above normal	28	10
Kankakee River at Momence	2,294	79	3857	2440	2437	above normal	28	11
Fox River at Dayton	2,642	80	2968	1971	1535	above normal	28	23
Vermilion River at Pontiac	579	53	632	471	242	normal	28	33
Spoon River at Seville	1,636	80	3279	1355	1279	much above normal	28	06
LaMoine River at Ripley	1,293	73	1586	1007	745	above normal	28	21
Mackinaw River near Congerville	767	48	1030	606	457	above normal	24	22
Sangamon River at Monticello	550	84	406	565	405	normal	28	50
Vermilion River near Danville	1,290	53	722	1398	1031	normal	28	60
Kaskaskia River at Vandalia	1,940	27	1260	2663	1848	normal	26	69
Shoal Creek near Breese	735	53	366	893	532	normal	28	60
Embarras River at Ste. Marie	1,516	83	951	1904	1570	normal	28	64
Skillet Fork at Wayne City	464	77	426	632	479	normal	28	52
Big Muddy at Plumfield	794	82	500	1057	958	normal	27	64

**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).**

February. Kinkaid Reservoir in Jackson County has been drawn down for maintenance since last September; White Hall has converted to an alternative ground-water supply and is using the reservoir as backup supply only. CORRECTION: Last month, the December 1997 water pumpage from Canton City Lake was incorrectly reported; the correct value for December 1997 pumpage was 86,350,000 gallons.

*Major Reservoirs.* Water levels at two lakes increased since the end of January: Carlyle Lake is just above the February target operating level and Lake Shelbyville is 2.6 feet above the target operating level. The water level at Rend Lake also increased since the end of January and is now 1.7 feet above normal pool.

**Great Lakes.** Current month mean and end-of-month values are provisional and are relative to IGLD 1985. The February mean level for Lake Michigan was 579.75 feet, compared to a mean level of 580.12 feet in February 1997. The long-term average lake level for February is 578.51 feet, based on 1918-1996 data. Historically, the lowest mean level for Lake Michigan in February occurred in 1964 at 576.08 feet, and the highest level occurred in 1986 at 581.07 feet. The month-end level of Lake Michigan was 579.78 feet.

## Ground-Water Information (Bryan Coulson)

**Comparison to Average Levels.** Shallow ground-water levels in 18 observation wells remote from pumping centers were above average for the month of February (Table 6). Levels averaged approximately 1.7 feet higher and ranged from 1.9 feet below to 6.7 feet above average levels for the month. The greatest deviation occurred in the northwestern part of the state.

**Comparison to Previous Month.** Statewide, shallow ground-water levels during February were above those of last month. Levels averaged approximately 1.8 feet above and ranged between 2.2 feet below and 7.3 feet above those of January. Greatest deviations occurred in the west-southwest crop reporting district at the observation well in Pike County.

**Comparison to Same Month, Previous Year.** Shallow ground-water levels this month were below those of February 1997. Levels averaged about 0.3 feet below average and ranged from 5.3 feet above to 2.3 feet below those one year ago.

**Table 6. Month-End Shallow Ground-Water-Level Data Sites, February 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	22.05	-0.25	-0.03	-1.37
2	Mt. Morris	Ogle	17.30	+2.96	-2.20	-2.30
3	Crystal Lake	McHenry	NA	NA	NA	NA
4	Cambridge	Henry	1.68	+6.73	+3.37	+4.37
5	Fermi Lab	DuPage	4.32	+1.11	-0.80	-1.42
6	Good Hope	McDonough	3.00	+4.98	+3.63	+5.27
7	Snicarte	Mason	38.78	-1.89	+0.48	-0.37
8	Middletown	Logan	1.91	+1.50	+0.04	-0.05
9	Swartz	Piatt	NA	NA	NA	NA
10	Coffman	Pike	6.42	+4.95	+7.29	-1.80
11	Greenfield	Greene	5.69	+3.76	+4.96	-0.75
12	Janesville	Cumberland	4.51	+0.08	+0.70	-2.00
13	St. Peter	Fayette	1.02	+0.77	+0.52	+0.05
14	SWS #2	St. Clair	13.25	+1.55	-0.03	-0.11
15	Boyleston	Wayne	1.65	+0.65	-0.06	-0.19
16	Sparta	Randolph	4.28	+2.01	+2.90	-0.48
17	SE College	Saline	1.60	-0.46	+1.89	-1.52
18	Dixon Springs	Pope	2.47	-0.79	+5.63	-1.77

**Note:** NA = not applicable