



Illinois State Water Survey

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ILLINOIS WATER AND CLIMATE SUMMARY May 2001

May 2001 Overview (Bob Scott)

Temperatures and precipitation in Illinois during May were above average. Soil moisture within the top 40 inches of soil was slightly below 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 continued to be observed in all water resources over extreme southeastern Illinois, but rainfall at the end of the month has generated an improving trend.

Temperatures across Illinois (Figure 1) for May were above average (a 0.8-degree departure). Crop reporting district (CRD) temperatures ranged from 0.3 degrees above average (west and southwest) to 1.4 degrees above average (east).

Precipitation amounts (Figure 1) were above the long-term average value for the month. Despite the dry start to May, the statewide average of 4.58 inches represents a 0.52-inch departure or 113 percent of average. District precipitation totals ranged from 3.65 inches (east) to 6.43 inches (west). Precipitation totals varied from 93 percent of average (southeast) to 159 percent of average (west). Although some much needed precipitation has occurred recently, the National Drought Mitigation Center continued to classify extreme southeastern Illinois in a region of moderate drought conditions (their lowest level of drought alert) at the end of May.

Soil moisture across Illinois in the 0- to 40-inch (0- to 100-centimeter) layer at the end of the month was slightly below normal (Figure 1). Conditions near the surface were below normal in southeastern Illinois but well above normal in west-central Illinois. Conditions in lower layers were near to above normal statewide, except for dry conditions over parts of central Illinois.

Mean provisional streamflow statewide was below the median flow, 94 percent of median (Figure 1). Rivers in northwestern Illinois recorded mean discharges in the normal to much above normal range. Flows in central and southern Illinois were in the normal to much below normal range. Peak stages on the Illinois River did not exceed flood stage except at Hardin. Mississippi River stations from Dubuque to Thebes recorded stages above flood stage. The Ohio River at Cairo peaked just below flood stage this month.

Water surface levels at the end of May were below the normal pool at 14 of 38 reporting reservoirs. Water surface levels at Carlyle Lake and Rend Lake were above target operating levels, while Lake Shelbyville was below the target level. **Lake Michigan's** mean level remains below the long-term average.

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

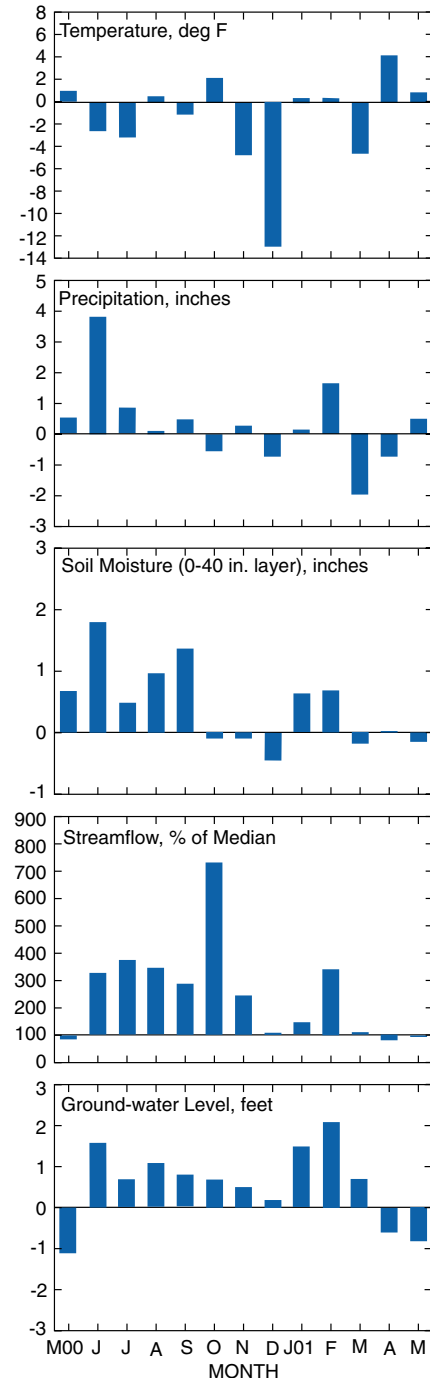


Figure 1.
Statewide departures from normal

Contact

Bob Scott: (217) 333-4966, email: r-scott5@uiuc.edu
On the Web at www.sws.uiuc.edu/warm

Statewide, **shallow ground-water levels** were below average for May by 0.8 feet. Regionally, levels in southeastern Illinois were below average at every station. Statewide levels averaged 0.7 feet below last month's levels and were approximately 0.8 feet above May levels one year ago.

Weather/Climate Information (Nancy Westcott, Jim Angel, and Bob Scott)

Cook County Precipitation. April precipitation amounts (Figure 2) were moderate. Site values for the month ranged from 2.38 inches at site #1 (Northbrook) to 3.98 inches at site #9 (Cicero). Precipitation was heaviest in the north-central part of the network and lightest in far northern and far southern sections. The April 2001 network average of 2.98 inches was 81 percent of the 11-year (1990–2000) April network average of 3.67 inches.

Temperatures across Illinois for May were slightly above average for the state as a whole (Figure 3 and Table 1). Regionally, the east CRD was the warmest region, while coolest temperatures were recorded in the west and southwest CRDs. In general, readings were much above average for the first 20 days of the month (a +6-degree departure). However, during the last 11 days of the month, temperatures dropped dramatically, ranging from 7 to 10 degrees below the average for the period. The warmest reading for the month, 96°F, occurred on May 16 at Stelle, while the coolest reading, 30°F, occurred on May 9 (Galesburg) and May 13 (Streamwood).

Precipitation was above the monthly average statewide (Figure 3 and Table 1). The west CRD reported 159 percent of average rainfall, followed closely by the northwest CRD with 149 percent of average. Although CRDs in the southern portion of the state were slightly below average for May, they were considerably wetter than during the first half of the month when precipitation was less than 50 percent of average, especially considering a similar dryness during March and April. The largest one-day precipitation amount in the state was 2.86 inches at Grand

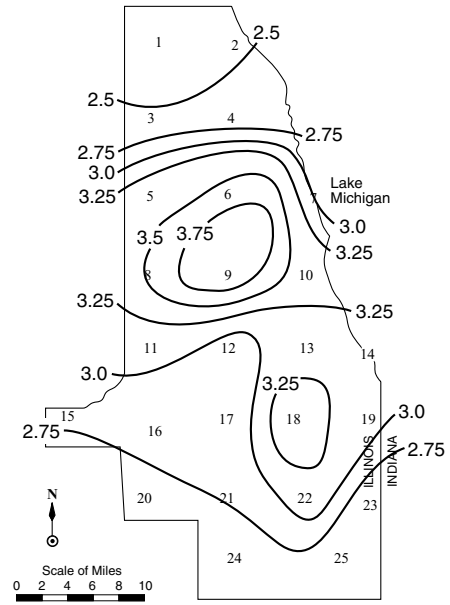


Figure 2.
Cook County precipitation (inches) during April 2001

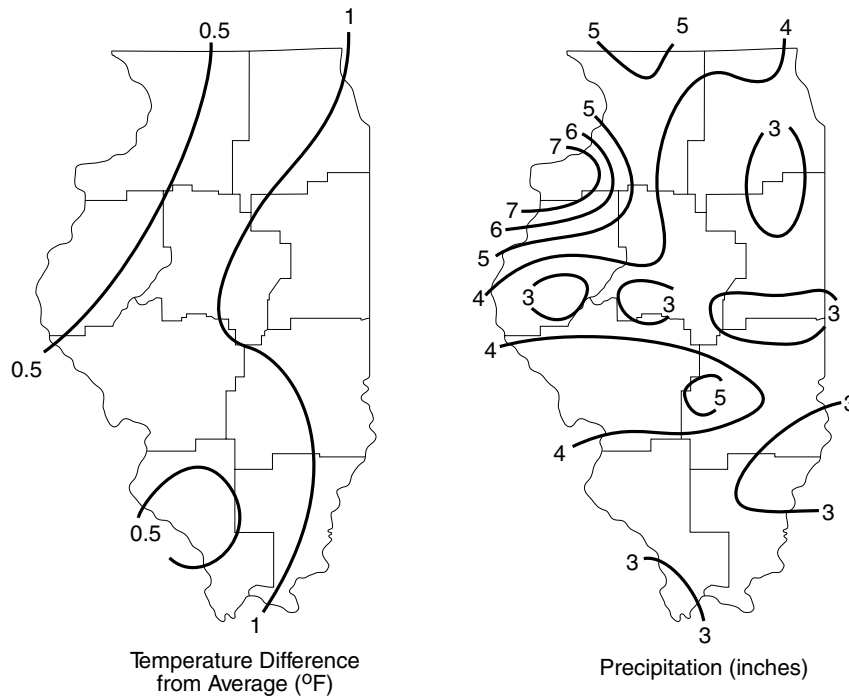


Figure 3. Illinois temperatures and precipitation during May 2001

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		
	May 01 Amount	% Avg	Tem Dev	Mar 01- May 01	% Avg	Temp Dev	Dec 00- May 01	% Avg	Temp Dev	Jun 00- May 01	% Avg	Temp Dev
Northwest	5.77	149	0.4	10.65	107	0.2	18.09	125	-1.9	39.64	112	-1.6
Northeast	3.89	106	0.9	8.24	83	0.4	14.81	98	-1.5	37.20	104	-1.3
West	6.43	159	0.3	11.80	111	0.0	20.05	128	-2.3	40.60	109	-1.8
Central	4.51	116	1.0	9.53	89	0.4	17.37	106	-1.7	36.94	100	-1.4
East	3.65	94	1.4	7.64	72	0.6	14.40	86	-1.7	34.48	93	-1.6
West-southwest	4.57	108	1.0	9.01	80	0.2	16.06	91	-1.9	42.19	112	-1.6
East-southeast	3.95	94	0.9	7.28	62	0.2	13.54	70	-1.7	44.98	112	-1.5
Southwest	4.16	98	0.3	7.90	63	-0.2	15.11	72	-2.0	38.94	94	-1.6
Southeast	4.24	93	0.7	8.39	63	0.1	16.80	74	-1.6	41.40	95	-1.4
State Average	4.58	113	0.8	8.93	80	0.2	16.18	93	-1.8	39.76	104	-1.5

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

Tower in southeastern Illinois (May 19). Moline recorded the largest monthly total, 9.60 inches, which ranked as the third wettest May on record for the station since 1926. The all-time record for this station was 11.43 inches in 1974.

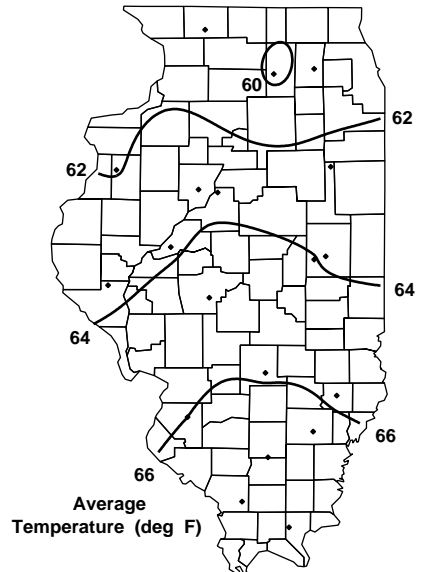
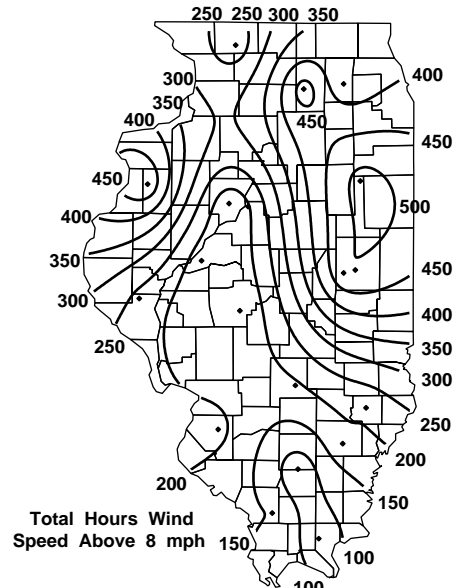
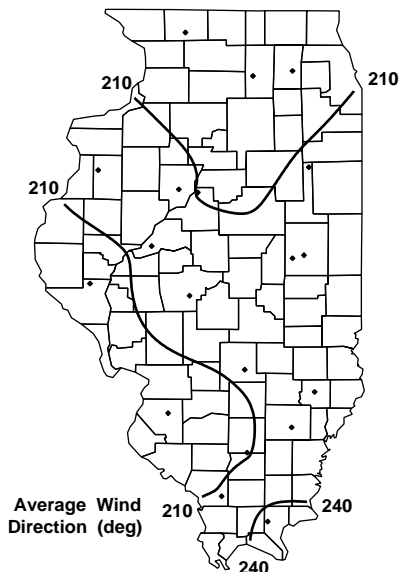
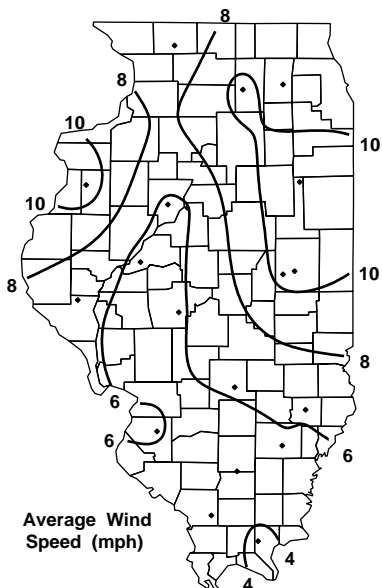
Severe weather was minimal in Illinois during May, which is usually quite a stormy month. The state experienced only a few instances of wind damage and one weak tornado. Thunderstorms moved through central Illinois on May 22, generating several reports of wind damage to trees and one report of ¾-inch hail in Havana. Thunderstorms again formed in central Illinois on May 23, leading to more reports of fallen trees. Isolated storms damaged trees in the Springfield and Champaign areas on May 26. Isolated thunderstorms also moved through southern Illinois on May 31, and an F0 tornado touched down briefly near Pinckneyville, causing no known damages or injuries.

Illinois Climate Network (ICN) Data. Average daily wind speeds across Illinois for May (Figure 4) ranged from 4 mph at Rend Lake and Dixon Springs to more than 14 mph at Monmouth and Stelle. The highest wind gust for the month, 55 mph, occurred at Stelle on May 6. The prevailing wind direction was generally from the south to southwest across the state. Wind speeds in excess of 8 mph ranged from 63 hours at Rend Lake to 519 hours at Bondville. (May has 744 hours.) Average air temperatures across Illinois ranged from near 60°F at DeKalb and St. Charles to approximately 67°F across the southern third of Illinois. Solar radiation ranged from 555 Mega-Joules per meter squared (MJ/m²) at Stelle to 698 MJ/m² at Dixon Springs. Potential evapotranspiration varied from 4.7 inches at DeKalb to 6.0 inches at Dixon Springs. Average 4-inch soil temperatures for May ranged from near 60°F across northeastern Illinois to 72°F at Dixon Springs. Average 8-inch soil temperatures for May ranged from the upper 50s across northeastern Illinois to the upper 60s 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 June and for climatological summer (June–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 the first half of May, especially in southeastern Illinois. Heavier rainfall occurred during the balance of the month. Thus, at the end of May, soil moisture conditions in the 0- to 6-inch layer were below normal only across southeastern Illinois and were well above normal in west-central Illinois (Figure 5). Values in this layer ranged from 50 to 60 percent of normal at Olney and Rend Lake, respectively, to more than 200 percent of normal at Topeka, Peoria, and Monmouth. Moisture conditions in the 6- to 20- and 20- to 40- inch layers showed dry conditions in central Illinois between Springfield and Topeka, with near to slightly above normal soil moisture elsewhere. Soil moisture in the 40- to 72-inch layer ranged from above normal in east-central Illinois (160 percent at Champaign) to below normal in southern and part of central Illinois (approximately 60 percent at Dixon Springs and Peoria). Overall, average soil moisture in Illinois at the end of May was slightly below normal (Figure 1).



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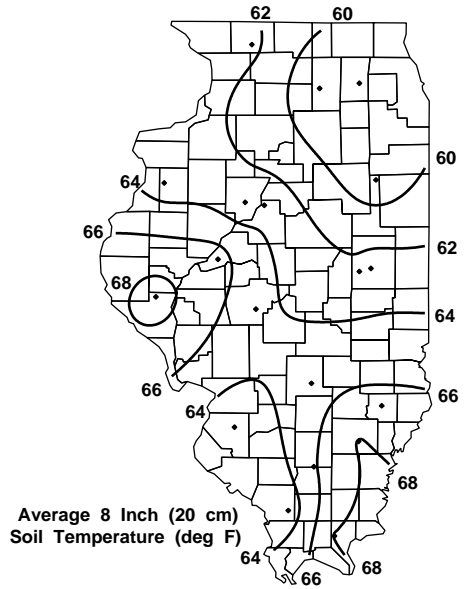
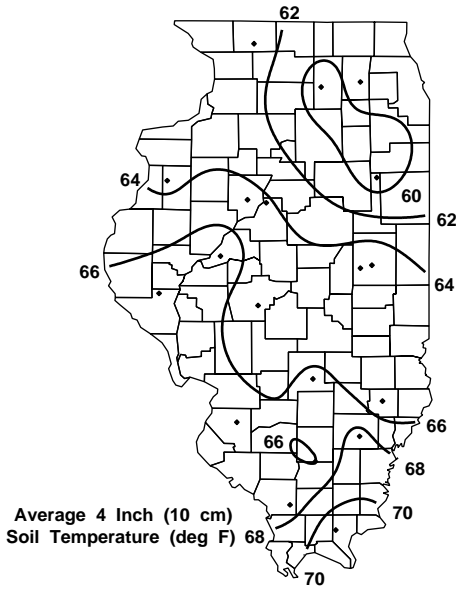
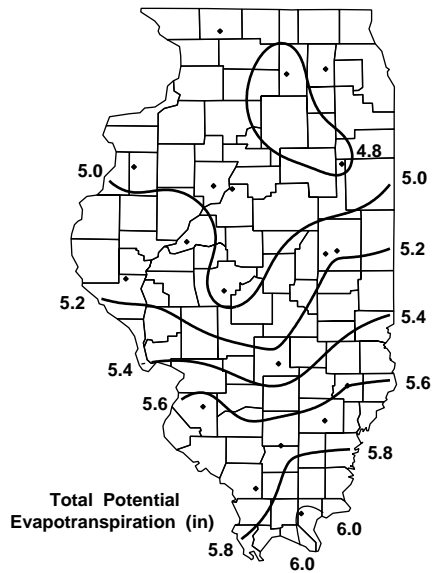
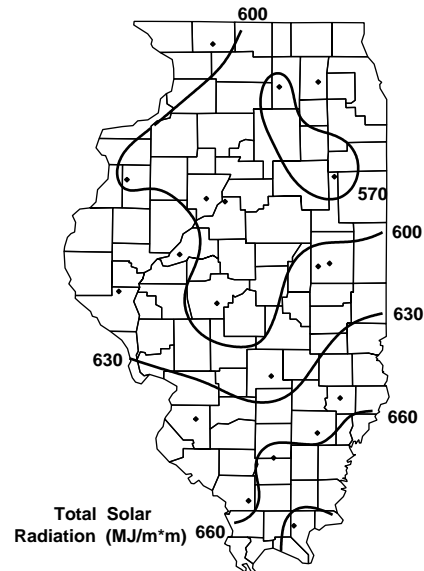


Figure 4. May monthly averages and totals as collected by the Illinois Climate Network

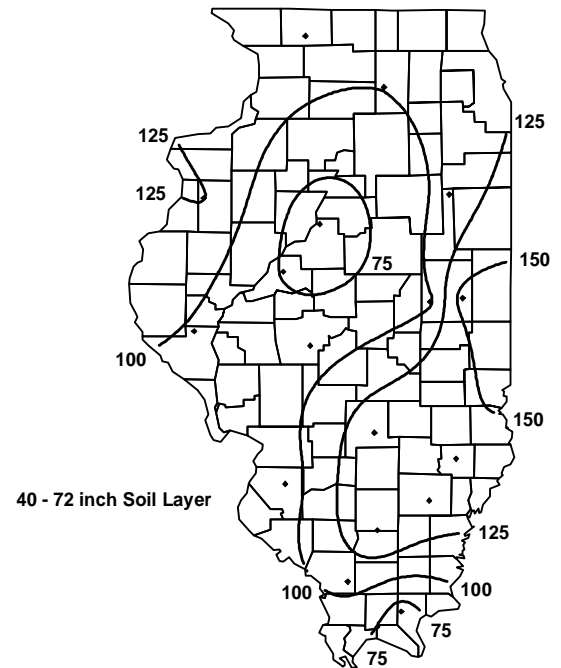
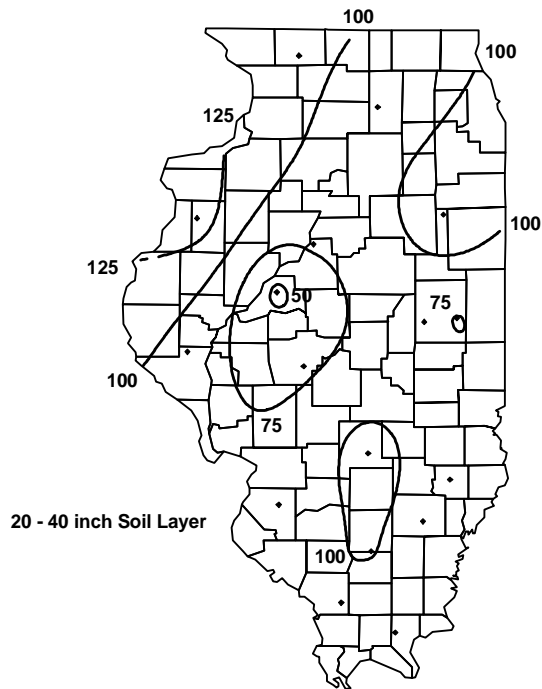
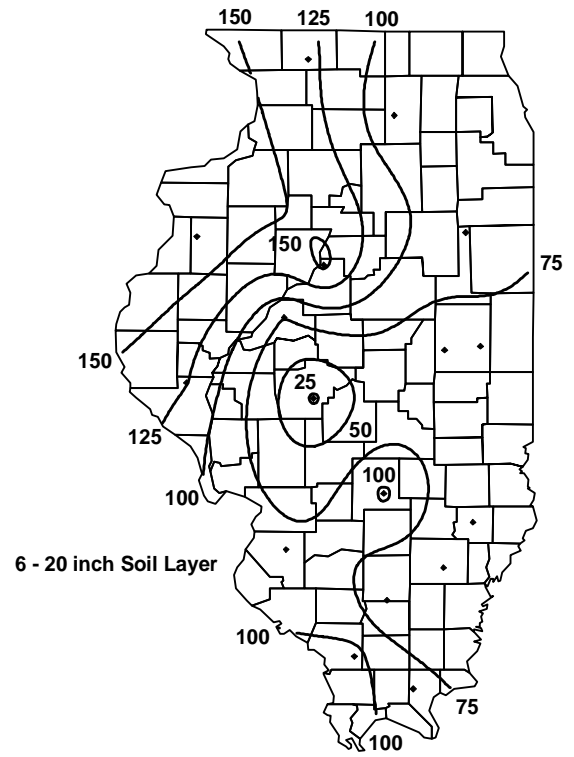
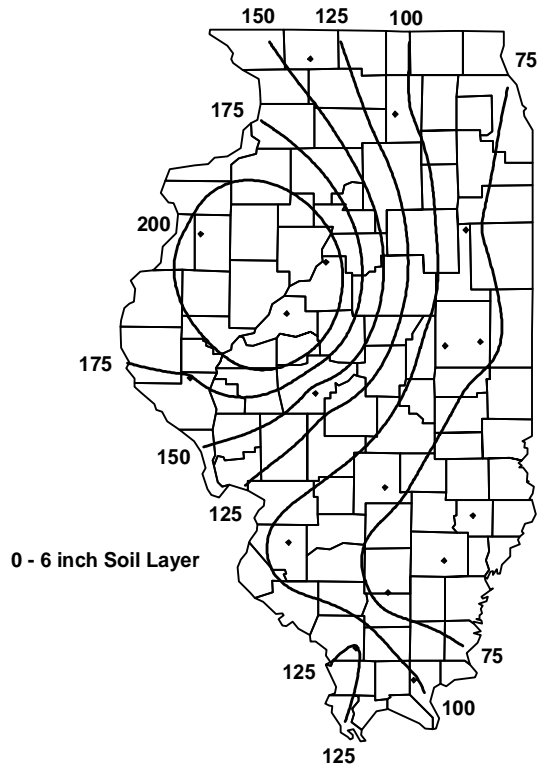


Figure 5. June 1 observed percent-of-normal soil moisture based on 1985-1995 mean

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

<i>Location</i>	<i>June 1 0 - 6 (inches)</i>	<i>Change from May 1 (%)</i>	<i>June 1 6 - 20 (inches)</i>	<i>Change from May 1 (%)</i>	<i>June 1 20 - 40 (inches)</i>	<i>Change from May 1 (%)</i>
Freeport (NW)	1.9	-4	4.4	-7	7.0	-2
DeKalb (NE)	1.7	-20	3.6	-29	6.7	-10
Monmouth (W)	2.5	31	5.2	13	7.1	6
East Peoria (C)	2.6	21	5.2	-1	7.5	-3
Topeka (C)	1.5	3	1.8	-31	2.2	-29
Stelle (E)	1.5	-39	4.7	-15	7.2	6
Champaign (E)	1.5	-5	4.0	-17	5.7	-16
Bondville (E)	1.4	-6	3.3	-26	7.5	-7
Perry (WSW)	2.4	22	5.1	-1	7.4	-6
Springfield (WSW)	1.9	8	3.9	-17	7.3	-5
Brownstown (ESE)	1.7	-30	4.0	-15	8.2	-3
Olney (ESE)	1.3	-28	3.8	-10	6.9	-2
Belleville (SW)	1.6	-23	3.1	-32	7.6	-8
Carbondale (SW)	2.3	27	4.5	4	7.6	0
Ina (SE)	1.4	-23	4.3	-13	7.6	-1
Fairfield (SE)	1.2	-27	3.6	-25	7.2	-3
Dixon Springs (SE)	1.9	2	4.1	-11	7.2	-7

Compared to one month ago, soil moisture during May in the 0- to 6-inch layer generally decreased statewide (Table 1), especially in southern Illinois. Maximum moisture reductions were roughly 20 to 30 percent. Conversely, scattered sites in the western half of the state reported increases of a similar magnitude. Moisture decreases dominated the 6- to 20- and 20- to 40-inch layers. Largest magnitudes (drops of 10 to 30 percent) occurred in the middle layer, while most observed changes from April data were in the 5 to 10 percent range in the deepest layer.

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, except at Hardin, which is influenced by high stages on the Mississippi River. Peak stage at Hardin was recorded on May 20. Stages on the Mississippi River continue to reflect flooding that dominated stages last month. Stations along the Illinois border from Dubuque to Thebes recorded peak stages above flood stage. The Mississippi River peaked on May 1 at Dubuque and on May 24 at Thebes. The provisional data show that the Ohio River at Cairo peaked just below flood stage this month.

Table 4 lists 26 streamgaging stations located throughout Illinois. Provisional monthly mean flows 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. Long-term mean flows for each month are published by the USGS. 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 below the median again this month (94 percent of median) and below the mean (66 percent of mean). Mean flows this month were lower than those recorded last month at nearly all stations.

Table 3. Peak Stages for Major Rivers, May 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	7.5	27
	La Salle	224.7	20	13.5	27
	Peoria	164.6	18	13.1	29
	Havana	119.6	14	11.5	31
	Beardstown	88.6	14	12.9	20
	Hardin	21.5	25	30.2	20
Mississippi	Dubuque	579.9	17	24.6	01
	Keokuk	364.2	16	22.8	15
	Quincy	325.0	17	27.3	16
	Grafton	218.0	18	25.2	19
	St. Louis	180.0	30	30.6	21
	Chester	109.9	27	31.5	22
	Thebes	43.7	33	34.0	24
Ohio	Cairo	2.0	40	39.7	25

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.

Still, in northwestern Illinois, flows recorded at stations on the Rock, Pecatonica, and Spoon Rivers were above normal for May. The Edwards River experienced much above normal flows. Conversely, flows in northeastern and central Illinois were in the normal to much below normal range for May. Flows in southern Illinois were below normal to much below normal. During the first half of May, flows observed at southern Illinois stations were extremely low, but began to recover in response to precipitation later in the month.

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 of the 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 April, available for 34 reservoirs, the water surface elevation at the end of May had risen at 17 reservoirs and decreased at 11 reservoirs. The reported elevation was the same as last month at 6 reservoirs. For the 38 reservoirs reporting at the end of May, 15 reservoirs had water surface levels above the normal pool (or target operating level), 9 reservoirs were at normal pool, and 14 reservoirs were below normal pool. Salem has been pumping water from Carlyle Lake since May 5.

Major Reservoirs. Water levels at Carlyle Lake and Lake Shelbyville increased this month. At the end of May, Carlyle Lake was just above target level and Lake Shelbyville was 1.6 feet below target level. 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 May mean level for Lake Michigan was 577.3 feet, compared to a mean level of 577.4 feet in 2000. The long-term average lake level for May is 579.2 feet, based on 1918–1998 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 577.5 feet.

Table 4. Provisional Mean Flows, May 2001

Station	Drainage area (sq mi)	Years of record	2001 mean flow (cfs)	Long-term flows		Flow condition	Percent chance of exceedence	Days of data this month
				Mean*	Median			
Rock River at Rockton	6,363	65	8,174	5,307	4,696	above normal	13	30
Rock River near Joslin	9,549	57	10,800	8,504	7,240	above normal	22	31
Pecatonica River at Freeport	1,326	81	1,622	977	784	above normal	11	31
Green River near Geneseo	1,003	61	779	985	826	normal	52	31
Edwards River near New Boston	445	62	1,395	472	318	much above normal	5	29
Kankakee River at Momence	2,294	82	1,858	2,906	2,786	below normal	72	30
Iroquois River near Chebanse	2,091	76	966	2,711	2,173	below normal	79	31
Fox River at Dayton	2,642	80	2,456	2,427	2,023	normal	39	31
Vermilion River at Pontiac	579	55	281	737	572	below normal	77	29
Spoon River at Seville	1,636	83	2,379	1,719	1,221	above normal	26	31
LaMoine River at Ripley	1,293	76	1,052	1,404	811	normal	43	31
Bear Creek near Marceline	349	55	289	399	177	normal	33	31
Mackinaw River near Congerville	767	51	569	911	720	normal	62	31
Salt Creek near Greenview	1,804	58	775	2,439	1,761	below normal	83	30
Sangamon River at Monticello	550	87	195	728	487	below normal	88	31
So. Fork Sangamon near Rochester	867	50	376	966	483	normal	65	31
Illinois River at Valley City	26,743	61	15,070	36,760	35,523	much below normal	92	31
Macoupin Creek near Kane	868	71	353	868	385	normal	52	31
Vermilion River near Danville	1,290	56	397	1,689	1,275	much below normal	93	31
Kaskaskia River at Vandalia	1,940	30	345	1,986	1,770	below normal	78	18
Shoal Creek near Breese	735	56	131	776	481	below normal	81	31
Embarras River at Ste. Marie	1,516	86	404	1,900	1,130	below normal	86	24
Skillet Fork at Wayne City	464	80	39	634	245	below normal	88	30
Little Wabash below Clay City	1,131	85	63.8	1,392	647	much below normal	94	31
Big Muddy at Plumfield	794	85	274	1,402	660	below normal	72	31
Cache River at Forman	244	76	19.1	416	285	much below normal	97	31

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.

Ground-Water Information (Ken Hlinka)

Comparison to Average Levels. Shallow ground-water levels in 13 observation wells, which are remote from pumping centers, were below the average levels for May (Table 6). Levels averaged 0.8 feet below and ranged from 3.1 feet below average to 1.7 feet above average. Below normal deviations occurred throughout the entire south-eastern portion of Illinois for the third consecutive month. One well, Dixon Springs (Pope County), located in extreme southeastern Illinois, is currently at its record low level for May. The Southeast College well (Saline County), located near Dixon Springs, is very near its record low for this month. These low levels are indicative of the dry conditions experienced over the last few months in this part of Illinois.

Comparison to Previous Month. Shallow ground-water levels were below those of April 2001. Levels averaged 0.7 feet below those of last month and ranged from 1.9 feet lower to 0.3 feet higher than the April observations.

Comparison to Same Month, Previous Year. Shallow ground-water levels from the network in May were above levels of May 2000. Levels in May 2001 averaged 0.8 feet higher and ranged from 3.6 feet lower to 6.3 feet above levels last year.

Table 6. Month-End Shallow Ground-Water Level Data Sites, May 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	21.26	-0.47	-0.54	+0.27	+0.81
2	Mt. Morris	Ogle	55.0	N/A	N/A	N/A	N/A	N/A
3	Crystal Lake	McHenry	18.0	N/A	N/A	N/A	N/A	N/A
4	Cambridge	Henry	42.0	4.30	+1.73	+1.74	-0.29	+0.98
5	Fermi Lab	DuPage	15.0	6.68	-1.19	-1.29	-1.05	+1.00
6	Good Hope	McDonough	30.0	N/A	N/A	N/A	N/A	N/A
7	Snicarte	Mason	42.0	35.82	+0.16	+0.20	-0.13	+2.58
8	Coffman	Pike	28.0	10.22	-1.73	-1.16	-0.51	+4.96
9	Greenfield	Greene	20.70	7.63	+0.44	+0.51	-0.32	+6.32
10	Janesville	Cumberland	11.0	5.79	-0.56	-0.46	-0.19	-0.20
11	St. Peter	Fayette	15.0	4.28	-1.83	-1.47	-1.04	-2.88
12	SWS #2	St. Clair	80.0	N/A	N/A	N/A	N/A	N/A
13	Boyleston	Wayne	23.0	4.74	-0.93	-0.85	-1.54	-0.80
14	Sparta	Randolph	27.0	5.31	-0.60	+0.50	-0.07	+0.42
15	SE College	Saline	10.19	6.24	-2.20	-2.64	-1.00	+0.39
16	Dixon Springs	Pope	8.63	5.62	-2.11	-3.05	-1.87	-3.62
17	Bondville	Champaign	21.0	4.50	-1.34	-1.36	-0.79	-0.27

Note:

NA = 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/>