

ILLINOIS WATER AND CLIMATE SUMMARY

July 2006

July 2006 Overview (Bob Scott)

Temperatures and precipitation in Illinois during July were slightly above average. Soil moisture within the top 40 inches of soil was below the long-term statewide average. Mean streamflows were below median heights. Shallow groundwater levels were below long-term average depths. Water resources in some areas of the state continue to indicate an incomplete recharge to normal levels due to impacts of the 2005 drought.

Temperatures across Illinois (Figure 1) for July were slightly above average (a +1.5-degree departure). Crop Reporting District (CRD) temperatures ranged from 0.2 degrees above average (southeast) to 2.3 degrees above average (central).

Precipitation amounts for Illinois in July were slightly above average overall (Figure 1) although regional variability was rather high. The statewide average of 4.38 inches represents a +0.55-inch departure or 114 percent of average. Totals varied from 3.30 inches (81 percent of average) in the east-southeast CRD to 5.98 inches (163 percent of average) in the southeast CRD.

Soil moisture in the 0- to 40-inch (0- to 100-centimeter) layer at the end of July was below normal for the state on the whole. However, regionally, soils were very wet in southern Illinois near the surface and dry to very dry in parts of central and southwestern Illinois in all layers.

Mean provisional streamflow statewide was below median flow in July, 81 percent of median (Figure 1). Rivers in Illinois recorded monthly mean discharges in the much below normal to above normal range. Macoupin Creek near Kane reported a new low for July monthly mean flow for its 76-year period of record. Peaks on major rivers did not exceed flood stage.

Water surface levels at the end of July were below the normal pool/target operating level at 24 of 33 reporting reservoirs. At the end of the month, Rend Lake was 2.7 feet above its target level, Lake Shelbyville was just above its target level, and Carlyle Lake was at its target level. Lake Michigan's mean level remains below the long-term average.

Statewide, **shallow groundwater levels** continue to be below normal with an average departure of -1.8 feet. Levels averaged 0.7 feet lower than June levels and were approximately 0.3 feet below July levels last year. Wells at Greenfield, Bondville, and Snicarte reported record lows for July.

Note: Extended network descriptions appear in the January and July issues. Network maps are available upon request.

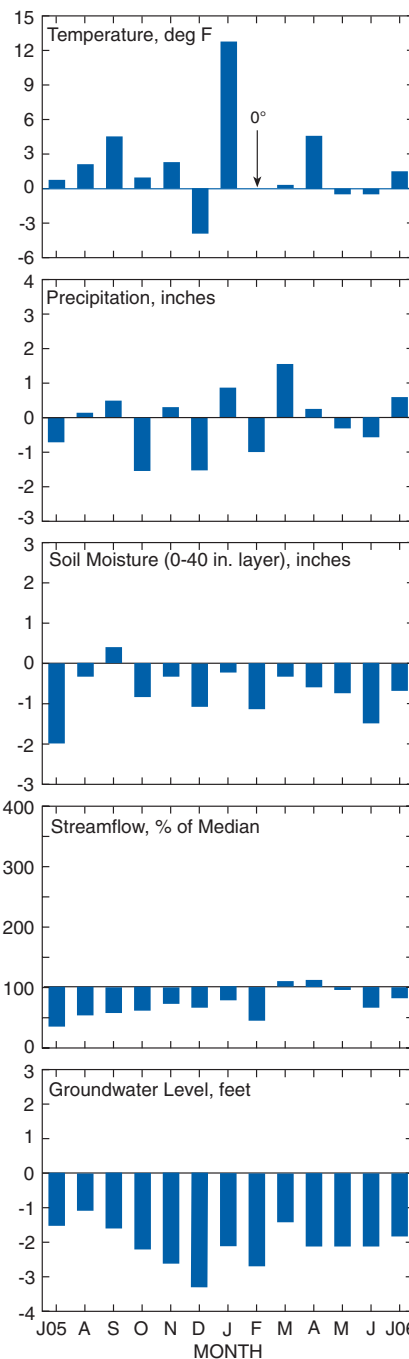


Figure 1. Statewide departures from normal

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Weather/Climate Information (Jim Angel and Bob Scott)

Temperatures across Illinois for July were above normal (Figure 2 and Table 1). It was the 13th warmest February–July and 5th warmest August–July since 1895. Extremes ranged from 46°F on July 7 at Mt. Carroll to 101°F on July 31 at Quincy.

Precipitation for July was above normal statewide (Figure 2 and Table 1), but with regional dryness. Cisco, near Decatur, reported the highest one-day precipitation, 6.23 inches on July 27, and also the highest monthly total, 14.27 inches. Concurrently, it was the 19th driest May–July in the west CRD since 1895, an indication of the difficulty other water resources in Illinois are having in recharging from the 2005 drought.

Severe weather, widely reported in Illinois in July, included seven reports of tornadoes. No damage occurred from a brief tornado in Macon County on July 12. Two tornadoes were reported in Fulton and Sangamon Counties, along with numerous reports of wind and hail damage in the western half of the state on July 19. No damage occurred from a tornado reported in Washington County on July 21. These storms caused widespread hail and wind damage in southern Illinois. Three tornadoes, one each in Macon, Piatt, and Vermilion Counties, were reported in east-central Illinois on July 26. No significant damage occurred with hail and winds on July 2, 3, 13, 17–20, 22, 27, and 29–30.

Illinois Climate Network (ICN) Data. Average daily wind speeds across Illinois for July (Figure 3) ranged from 2.5 mph at Dixon Springs to 7.5 mph at Stelle. Six sites recorded maximum wind gusts in excess of 40 mph on six days in July. Highest gusts recorded were at Belleville (54 mph on July 21) and at Stelle (53 mph on July 20). The prevailing wind direction was northeasterly in northeastern and southeastern Illinois, and southerly in western Illinois. Wind speeds in excess of 8 mph varied from 15 hours at Kilbourne and Rend Lake to 290 hours at Stelle. (July has 744 hours.) Average air temperatures in July ranged from 73°F at DeKalb to 78°F at Rend Lake, Carbondale, and Fairfield.

Solar radiation totals in July remained as high as totals observed in June, and varied from 672 Mega-Joules per meter squared (MJ/m²) at DeKalb and Big Bend to near 766 MJ/m² at Belleville. Potential evapotranspiration observations also peaked near annual maximums, varying from a low of 6.1 inches at DeKalb to 7.2 inches at Belleville. Soil temperatures at the 4- and 8-inch levels ranged from the low to middle 70s in northern Illinois to the low 80s in far southern Illinois.

Extended climate outlooks issued by the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Climate Prediction Center for August and for August–October call for temperatures across the state to be above normal and for precipitation to be below normal in southern and east-central Illinois.

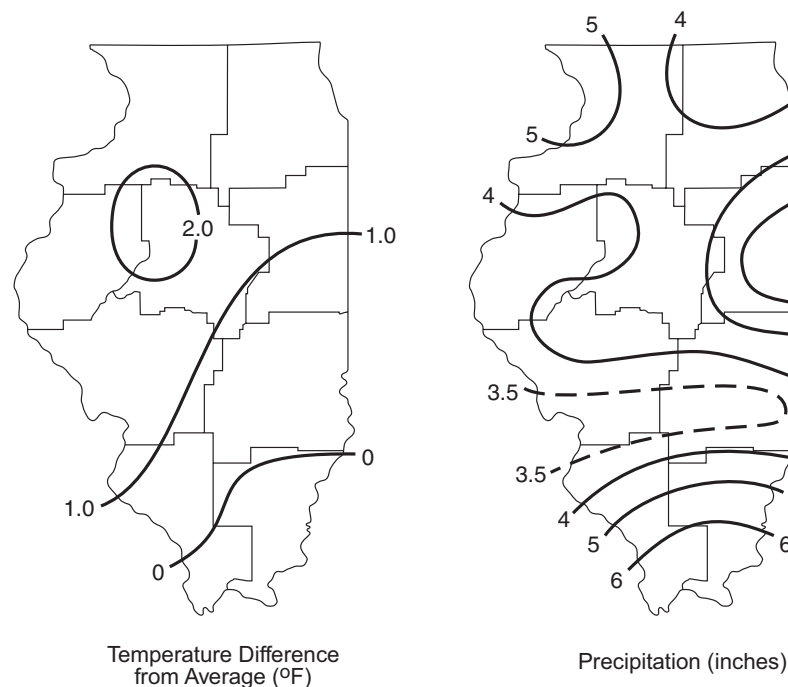


Figure 2. Illinois temperature and precipitation during July 2006

Table 1. Illinois Precipitation (inches) and Temperature (°F) by Crop Reporting District

Crop Reporting District	<u>Last Month</u>			<u>Last 3 Months</u>			<u>Last 6 Months</u>			<u>Last 12 Months</u>		
	Jul 06 Amount	% Avg	Temp Dev	May 06- Jul 06	% Avg	Temp Dev	Feb 06- Jul 06	% Avg	Temp Dev	Aug 05- Jul 06	% Avg	Temp Dev
Northwest	4.85	133	1.8	12.10	99	0.2	21.13	107	1.1	34.31	95	2.2
Northeast	4.22	112	1.8	12.06	102	0.2	20.18	103	1.2	33.25	91	2.2
West	3.87	94	2.2	9.12	72	0.7	17.04	82	1.2	31.41	84	2.3
Central	4.21	108	2.3	9.68	80	0.5	18.55	91	1.2	32.74	88	2.2
East	5.74	142	1.5	12.70	103	-0.3	22.32	109	0.7	37.58	100	1.8
West-southwest	3.45	97	1.8	9.57	82	0.4	16.48	80	1.1	31.80	84	2.1
East-southeast	3.30	81	1.1	12.09	97	0.1	23.18	104	0.7	41.25	100	1.8
Southwest	4.60	124	0.9	13.09	108	0.4	24.43	107	1.0	44.87	105	2.1
Southeast	5.98	163	0.2	15.02	120	0.0	27.88	115	0.9	50.60	114	2.1
State Average	4.38	114	1.5	11.60	95	0.2	20.98	99	1.0	37.01	95	2.1

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

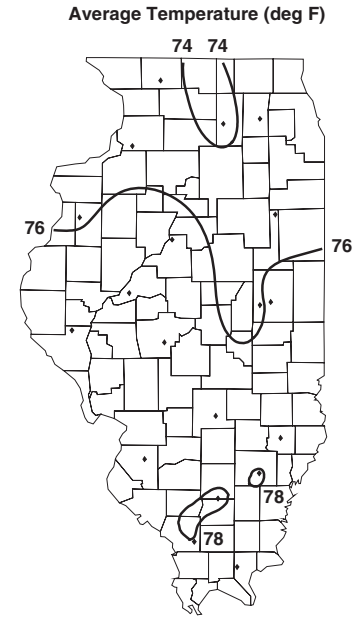
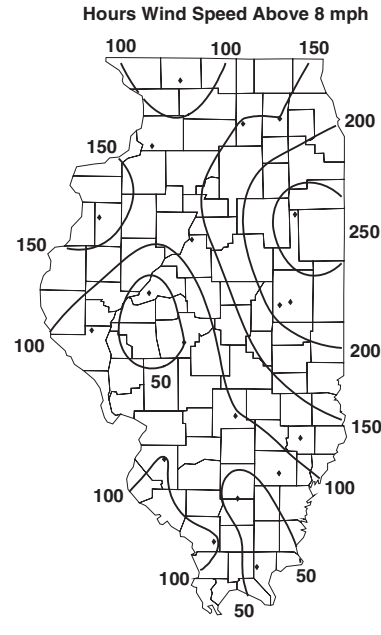
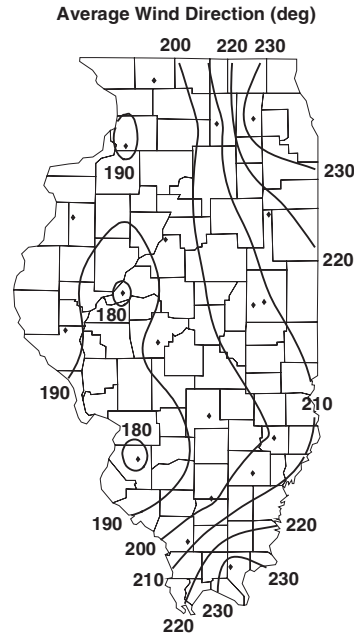
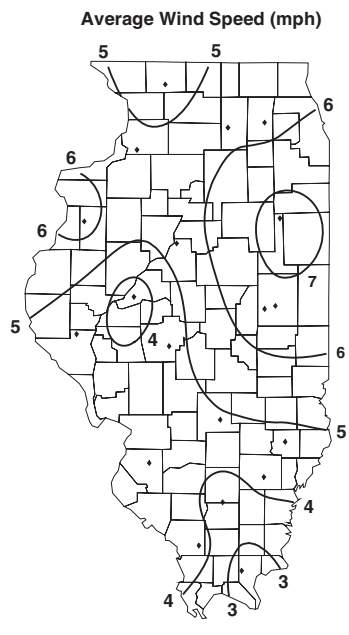
Additional Information: Illinois temperature and precipitation data included in these monthly reports are from measurements taken at selected sites within the Cooperative Observer Network of the National Weather Service (NWS), an agency of the National Oceanic and Atmospheric Administration (NOAA), U.S. Department of Commerce (USDOC). The Midwestern Regional Climate Center (MRCC) at the Illinois State Water Survey (ISWS) receives near real-time data. These data are provisional. The MRCC receives complete, quality-controlled data from the National Climatic Data Center (NCDC), NOAA, USDOC, about three months after data are collected.

The Illinois Climate Network (ICN) is a 19-site array of automated weather stations across Illinois operated by the ISWS. The network provides enhanced temporal weather observations on numerous weather and climate variables, including atmospheric pressure, air temperature, relative humidity, wind speed and direction, solar radiation, and precipitation. Values of potential evapotranspiration and dewpoint temperatures are computed and added to the dataset. Other direct observations of weather-related variables include soil temperatures and moisture data at various depths and shallow water-table level readings. Sites are located primarily at university agricultural experimental farms and community colleges in Illinois. Most sensors are polled automatically every 10 seconds and averaged by hour and day. Hourly and daily extremes and times of occurrence for some variables also are recorded. All data are downloaded to an ISWS computer once a day. Daily maximum and minimum temperature and precipitation data are added to the MRCC records. The ICN data provide valuable information on extreme and usual weather events, as well as short- and long-term trends in climate data, that may have direct future impacts on other water resources of Illinois.

Extended climate outlooks are produced on a monthly and seasonal basis by the Climate Prediction Center (CPC), NOAA, USDOC, based on extensive sources of timely climate information. Outlooks for Illinois are extracted from the CPC records and included in this report as a service to our readers.

Soil Moisture Information (Bob Scott)

Precipitation across southern Illinois during July was above average, but below average rainfall in west, central, and west-southwestern Illinois during the last three months resulted in quite complex soil moisture conditions over the state. At the end of July, soil moisture near the surface was well above normal across southern Illinois but below normal in west-southwestern Illinois (Figure 4). Values in the 0- to 6-inch layer ranged from 25 percent of normal at Belleville to more than 200 percent at Carbondale and Dixon Springs. Stelle in northeastern Illinois also reported high soil moisture of 193 percent. Conditions in the 6- to 20-inch layer were just as complex: values ranged from less than 10 percent at Belleville to more than 200 percent at Carbondale. Bondville and Champaign in eastern Illinois each reported very wet soils, with values near 190 percent. Moisture amounts in deeper layers were more moderate. Values in the 20- to 40-inch layer varied from 35 percent at East Peoria, Topeka, and Springfield to 170 percent at Bondville and Champaign. Concurrently, soil moisture 40 to 72 inches deep ranged from 40 percent at East Peoria to 128 percent at Rend Lake and Fairfield. Overall, soil moisture in Illinois at the end of July was below normal (Figure 1).



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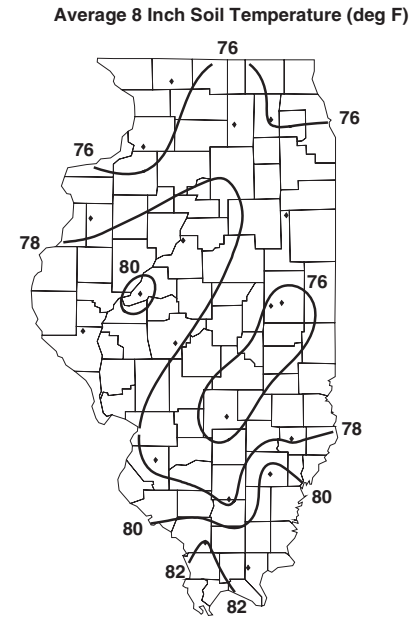
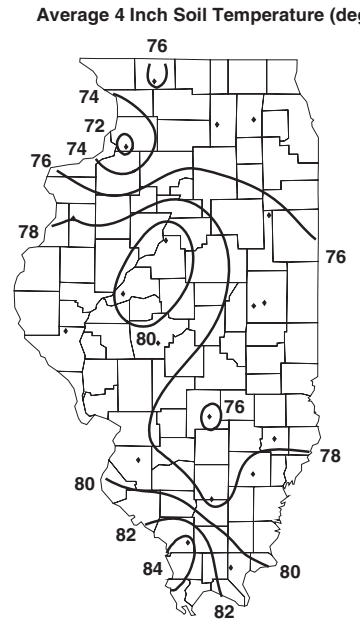
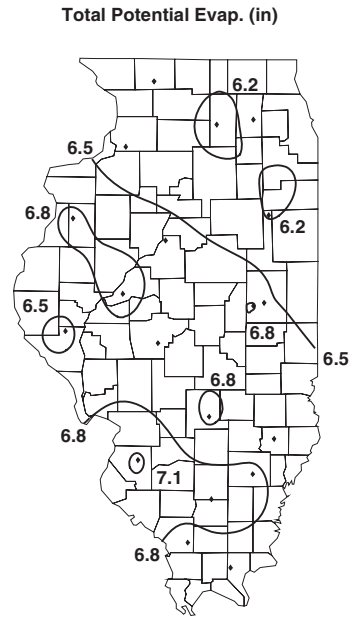
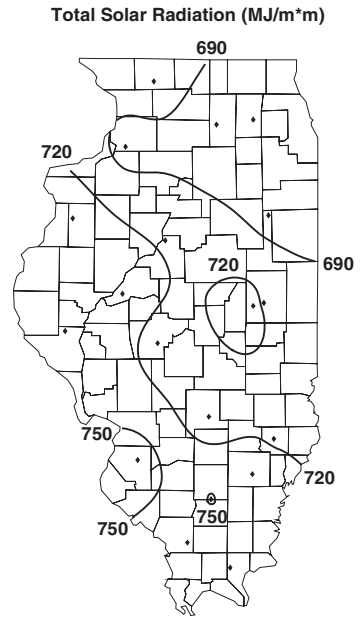


Figure 3. July monthly averages and totals as collected by the Illinois Climate Network

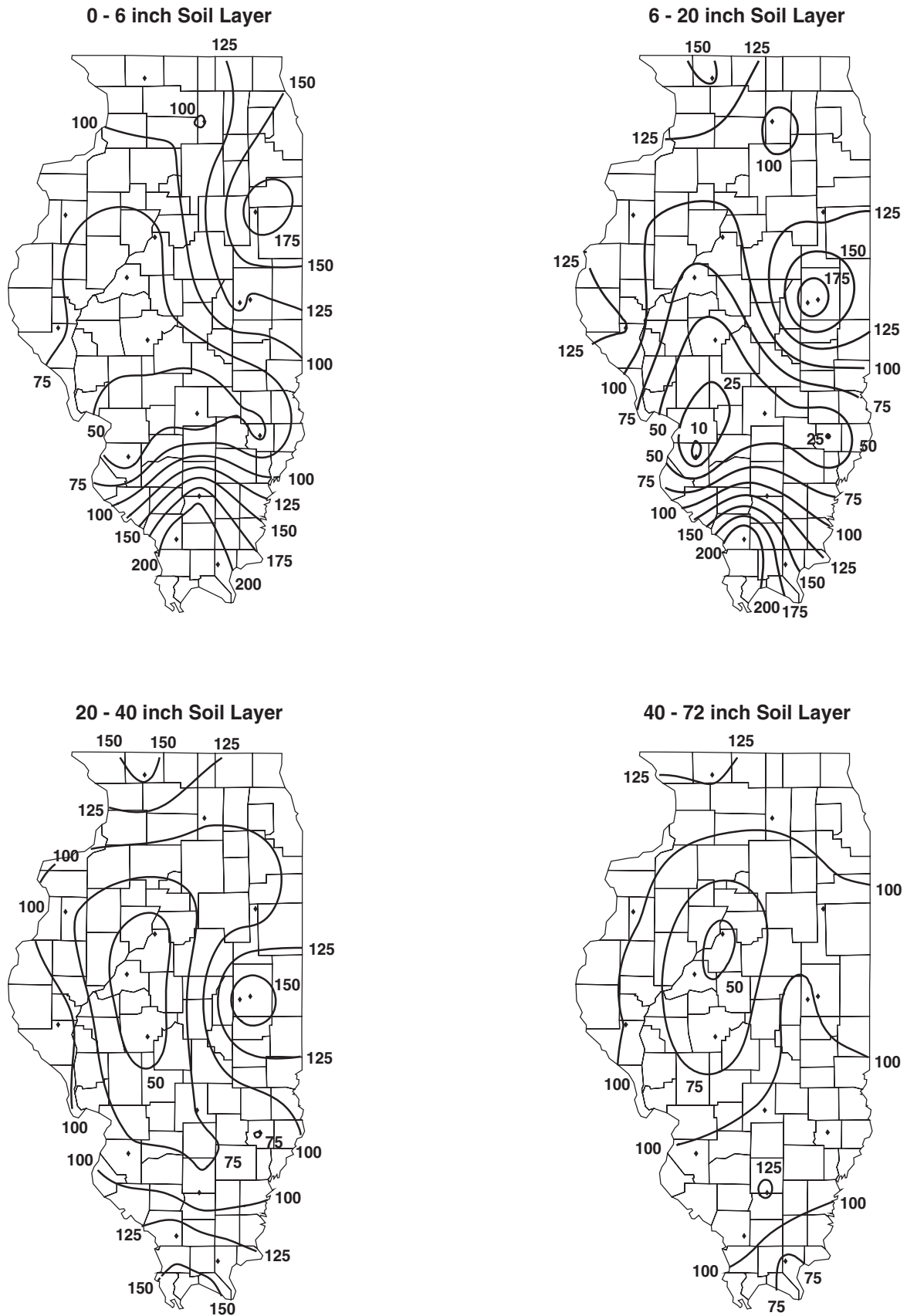


Figure 4. August 1 observed percent-of-normal soil moisture based on 1985-1995 mean

Table 2. Soil Moisture in Various Layers on August 1, 2006

<i>Location</i>	<i>Aug 1 0 - 6 (inches)</i>	<i>Change from Jul 1 (%)</i>	<i>Aug 1 6 - 20 (inches)</i>	<i>Change from Jul 1 (%)</i>	<i>Aug 1 20 - 40 (inches)</i>	<i>Change from Jul 1 (%)</i>
Freeport (NW)	1.6	0	4.0	0	6.3	0
DeKalb (NE)	1.7	-16	3.9	-13	6.4	-7
Monmouth (W)	1.4	-2	3.4	-2	5.6	-4
East Peoria (C)	0.7	0	2.9	0	6.3	0
Topeka (C)	0.5	0	1.6	0	2.2	0
Stelle (E)	2.0	40	4.2	7	5.9	-7
Champaign (E)	1.8	10	5.5	49	6.9	22
Bondville (E)	1.8	0	4.0	0	7.1	0
Perry (WSW)	1.3	-4	4.4	-2	7.3	-5
Springfield (WSW)	1.1	0	3.5	0	6.7	0
Brownstown (ESE)	1.7	0	3.4	0	7.8	0
Olney (ESE)	0.9	-7	3.6	-10	6.3	-7
Belleville (SW)	0.6	-13	0.9	-54	5.6	-18
Carbondale (SW)	1.3	0	2.8	0	6.8	0
Ina (SE)	2.0	79	4.9	21	7.3	-2
Fairfield (SE)	1.9	0	5.1	0	7.5	0
Dixon Springs (SE)	2.3	46	5.6	5	8.1	2

Compared to conditions at the end of June, changes in soil moisture during July were quite large at some sites, but small elsewhere (Table 2). Increases were common in most layers at Stelle, Champaign, Rend Lake, and Dixon Springs, including an increase of 79 percent at Rend Lake in the 0- to 6-inch layer. Decreases were observed at DeKalb, Olney, and Belleville, including a drop of 54 percent at Belleville in the 6- to 20-inch layer. Surprisingly, no other site reported moisture changes of more than 5 percent in any layer.

Additional Information: Soil moisture is monitored at 17 sites across Illinois by ISWS staff at sites mostly co-located with ICN locations. Historic data were collected manually during twice monthly site visits in the growing season (March–October) and once monthly during the remainder of the year. This continues at some sites. Other sites have been converted to automatic readings downloaded nightly within the ICN data stream. These data aid in pinpointing area and extent of unusual soil moisture levels, impacts on Illinois agriculture, and provide insight to potential pending stresses on other water resources of the state. The information becomes especially important during prolonged periods of precipitation drought.

Surface Water Information (Bill Saylor and Vern Knapp)

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 (ISWS), and the USACE. Provisional discharge data are obtained from the USGS.

Table 3 lists the provisional peak stage for the current month compared to flood stage at selected streamgaging stations located on the Illinois, Mississippi, and Ohio Rivers. The peak stage is determined from the daily morning readings posted by the National Weather Service and/or the USACE. Peak stages at the stations listed in Table 3 were below flood stage in July.

Provisional monthly mean flows for 26 streamgaging stations located throughout Illinois are shown (Table 4). Mean values posted by the USGS are listed if available; otherwise, daily mean discharge data posted by the USGS are used to estimate the mean flow for the month. The USGS publishes long-term mean flows for each month. The month's median flow for each station listed in Table 4 was determined by ranking the July mean flow for each year of record, and selecting the middle value, the 50 percent exceedence probability.

Table 3. Peak Stages for Major Rivers, July 2006

<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	16	6.5	13
	La Salle	224.7	20	12.7	15
	Peoria	164.6	18	12.6	16
	Havana	119.6	14	7.2	22
	Beardstown	88.6	14	9.9	05
	Hardin	21.5	25	20.1	17
Mississippi	Dubuque	579.9	17	7.6	01
	Keokuk	364.2	16	3.7	01
	Quincy	327.9	17	12.1	14
	Grafton	218.0	18	16.1	07
	St. Louis	180.0	30	4.3	01
	Chester	109.9	27	6.7	02
	Thebes	43.7	33	10.8	03
Ohio	Cairo	2.0	40	20.4	04

Notes:

*River mile and flood stage from *River Stages in Illinois: Flood and Damage Data*, Illinois Department of Natural Resources, Office of Water Resources, August 2004 (except as revised by the National Weather Service).

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

The statewide percent of historical mean flow and percent of historical median flow are calculated by dividing the sum of the average flows this month at stations in Table 4 by the sum of the historical mean and median flows calculated for the month, respectively, at the same stations. This method is intended to weight individual observations proportionately in the aggregate comparison. (The Illinois River and Rock River stations are excluded from the statewide calculation because other rivers listed in Table 4 contribute to their flow.)

Mean provisional flow statewide was below the median value for July (81 percent of the median) and below the long-term mean (53 percent of the mean). Mean streamflows at Table 4 stations ranged from much below normal on some western Illinois streams to above normal in southernmost Illinois. The lowest observed mean monthly streamflow ever recorded for the month of July was at Macoupin Creek near Kane.

Water-Supply Lakes and Major Reservoirs. Table 5 lists reservoirs in Illinois, their normal pool or target water surface elevation, 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 ISWS staff for the current water levels. Reservoir levels are reported in terms of their difference from normal pool (or target level). The average of the month-end readings for the period of record is reported in terms of the difference from normal pool or target level (column 6 of Table 5). The number of years of record for each reservoir also is given (column 7). Most reservoirs serve as public water supplies, with the exceptions noted in the last column.

Compared to end-of-June levels at 33 reservoirs, end-of-July levels had increased at 4 reservoirs, had decreased at 24 reservoirs, and were the same as last month at 5 reservoirs. For the 33 reservoirs with observations reported at the end of July, 3 reservoirs were above normal pool (or target operating level), 6 reservoirs were at normal pool or spillway elevation, and 24 reservoirs were below normal pool.

Major Reservoirs. Compared to end-of-June water levels, end-of-July levels had increased 0.1 foot at Lake Shelbyville, had decreased 0.4 foot at Rend Lake, and had decreased a foot at Carlyle Lake. At the end of July, Rend Lake was 2.7 feet above its target level, Lake Shelbyville was 0.2 foot above its seasonal target level, and Carlyle Lake was at its seasonal target level.

Table 4. Provisional Mean Flows, July 2006

<i>Station</i>	<i>Drainage area (sq mi)</i>	<i>Years of record</i>	<i>2006 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*</i>	<i>Median</i>			
				<i>(cfs)</i>	<i>(cfs)</i>			
Rock River at Rockton	6363	70	3099	3770	2850	normal	41	31
Rock River near Joslin	9549	62	4569	5921	4513	normal	49	31
Pecatonica River at Freeport	1326	86	724	910	681	normal	46	31
Green River near Geneseo	1003	67	193	560	411	below normal	87	31
Edwards River near New Boston	445	67	38	298	165	much below normal	94	31
Kankakee River at Momence	2294	88	1400	1519	1309	normal	47	31
Iroquois River near Chebanse	2091	81	905	1325	738	normal	44	31
Fox River at Dayton	2642	86	953	1271	915	normal	48	31
Vermilion River at Pontiac	579	61	259	325	174	normal	37	31
Spoon River at Seville	1636	88	160	1039	618	much below normal	93	25
LaMoine River at Ripley	1293	82	65	775	377	below normal	89	31
Bear Creek near Marceline	349	61	3.9	269	105	much below normal	92	31
Mackinaw River near Congerville	767	56	53	371	220	below normal	86	31
Salt Creek near Greenview	1804	63	717	1214	822	normal	53	31
Sangamon River at Monticello	550	93	228	284	167	normal	39	31
South Fork Sangamon near Rochester	867	56	66	370	186	below normal	81	31
Illinois River at Valley City	26,743	66	10,040	21,560	19,094	below normal	81	31
Macoupin Creek near Kane	868	76	9.1	318	131	much below normal	**	31
Vermilion River near Danville	1290	83	656	790	464	normal	40	31
Kaskaskia River at Vandalia	1940	35	270	1300	1141	below normal	89	31
Shoal Creek near Breese	735	61	27	306	120	much below normal	90	31
Embarras River at Ste. Marie	1516	91	347	747	432	normal	59	31
Skillet Fork at Wayne City	464	85	17	157	63	normal	69	31
Little Wabash below Clay City	1131	90	195	474	204	normal	51	31
Big Muddy at Plumfield	794	34	567	409	381	above normal	20	31
Cache River at Forman	244	81	124	86	35	above normal	15	31

Notes:

N/A = not available.

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.

*As reported in U.S. Geological Survey (USGS) Water Resources Data, Illinois, Water Year 2004.

** New low for July monthly mean flow for the period of record.

Table 5. Reservoir Levels in Illinois, July 2006

For security considerations, statewide tabular reservoir data are not available on the Internet. Specific data requests may be made to Bill Saylor at: wsaylor@sws.uiuc.edu.

Great Lakes. Current month mean and end-of-month values are provisional and are relative to International Great Lakes Datum 1985. The July mean level for Lake Michigan was 577.9 feet, compared to a mean level of 578.1 feet in July 2005. The long-term average lake level for July is 579.4 feet, based on 1918–2005 data. Historically, the lowest mean level for Lake Michigan in July occurred in 1964 at 576.7 feet, and the highest level occurred in 1986 at 582.0 feet. The month-end level of Lake Michigan was 578.0 feet.

Additional Information: River stage observations 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 (ISWS), and the USACE. Provisional discharge data are obtained from the USGS. Stage observations are reported at 14 locations along the Illinois, Mississippi, and Ohio Rivers. River stage is the observed water surface level at the gage location relative to the gage's own datum or zero mark. The elevation of gage zero for each site was set arbitrarily, and varies from station to station. Stage is not equivalent to the depth to the river bottom. *Flood stage* is a specified stage value, typically describing the approximate level at which a river goes out of its banks at or near the gage location. Flood stage designations vary from station to station, and apply locally. Stage may be converted to an elevation (relative to mean sea level) by adding the stage value to the gage datum elevation, as reported in a common vertical datum (e.g., National Geodetic Vertical Datum, 1929).

Streamflow data are obtained for 26 stations along selected Illinois streams and rivers from long-term monthly means published by the USGS. Monthly median flow is determined by ranking the monthly mean flows for the same month for each year of record, and selecting the middle value, to determine a 50 percent chance exceedence value. The current month's flow condition at each station is classified from much above normal to much below normal by a comparison of the mean flow for the current month relative to the monthly mean flow statistics during the period of record for the same month. With very few exceptions, the median flow for a particular month will be less than the mean flow. The current month's flow as a percent of the median in nearly every case will be higher than the percent of the mean.

Reservoir levels are obtained from a network of cooperating reservoir operators who are contacted each month by ISWS staff. The current month's average month-end water surface level for each reservoir is the arithmetic average of the month-end levels for the period of record of reports to ISWS. Most of the reservoirs polled serve their local communities as public water-supply reservoirs. The ISWS began collecting month-end water surface elevations at reservoirs in 1983, and the number of reporting stations has increased over time to the present total, 39 reservoirs. Trends in these data give indications of potential water deficit problems during periods of extended drought conditions.

Groundwater Information (Ken Hlinka)

Comparison to Average Levels. Shallow groundwater levels in 15 observation wells, which are remote from pumping centers, were below average levels for the 16th consecutive month. July levels were 1.8 feet below normal and ranged from 6.7 feet below to 1.8 feet above normal levels (Table 6). Three wells, Greenfield (Greene County), Bondville (Champaign County), and Snicarte (Mason County) were at record lows for July.

Comparison to Previous Month. Shallow groundwater levels were below those of June. Levels averaged 0.7 feet lower and ranged from 1.8 feet below to 1.5 feet above levels last month.

Comparison to Same Month, Previous Year. Shallow groundwater levels in July were below levels measured one year ago. Levels averaged 0.3 feet lower and ranged from 4.0 feet lower to 2.2 feet higher than during July 2005.

Additional Information. Shallow groundwater well monitoring is conducted at 17 locations in Illinois sited in rural areas to measure water-table conditions under natural conditions remote from pumping stations. Wells are installed with on-site recording devices and downloaded during monthly site visits. These data enable ISWS staff to assess short- and long-term trends in water-table levels to enhance the understanding of the impacts and extent of phenomena such as droughts and floods in Illinois. In particular, these data become important to monitor the lingering effects of periods of deficit precipitation on the shallow groundwater resources of the state.

Table 6. Month-End Shallow Groundwater-Level Data Sites, July 2006

Number	Well name	County	Well depth (feet)	This month's reading (depth to water, feet)	15-year avg. level (feet)	<i>Deviation from</i>		
						Period of record avg. (feet)	Previous month (feet)	Previous year (feet)
1	Galena	JoDaviess	25.00	21.63	-1.27	-0.66	+0.16	+0.18
2	Mt. Morris	Ogle	55.00	23.72	-6.46	-5.79	+0.60	+0.16
3	Crystal Lake	McHenry	18.00	5.74	-0.84	-0.68	-0.65	+0.25
4	Cambridge	Henry	42.00	40.86*	N/A	N/A	N/A	N/A
5	Fermi Lab	DuPage	17.00	N/A	N/A	N/A	N/A	N/A
6	Good Hope	McDonough	30.00	6.52	-0.38	+0.89	-1.80	+0.12
7	Snicarte	Mason	40.30	40.40**	-3.66	-3.76	-0.56	-1.68
8	Coffman	Pike	28.00	16.93	-4.90	-4.31	-1.21	-2.58
9	Greenfield	Greene	20.70	18.72**	-6.46	-6.69	-0.76	-3.98
10	Janesville	Cumberland	11.00	6.53	-0.71	-0.58	-1.25	+0.85
11	St. Peter	Fayette	15.00	4.44	-0.40	-0.23	-1.78	+0.44
12	SWS #2	St. Clair	80.00	17.92	-4.89	-3.12	-0.79	N/A
13	Boyleston	Wayne	23.00	3.79	+1.22	+1.81	-0.64	+2.20
14	Sparta	Randolph	27.00	9.10	-2.45	-1.32	-1.42	-0.50
15	SE College	Saline	10.19	6.76	0.00	-0.21	-0.41	+0.80
16	Dixon Springs	Pope	8.63	5.27	1.04	-0.76	+1.52	+0.22
17	Bondville	Champaign	21.00	6.81**	-2.11	-2.19	-1.31	-0.31
Averages					-2.31	-1.84	-0.69	-0.27

Notes:

N/A = Data not available.

*Well not used for analyses.

**Well currently at record monthly low.

Addendum (Nancy Westcott)

Imperial Valley Precipitation. July 2006 precipitation amounts (Figure 5a) were quite variable. Monthly gage totals were greatest along the eastern and western edges of the network, and precipitation was lightest in the central region of the network. Individual gage amounts ranged from 5.75 inches at site #8 to 2.07 inches at site #2. The 30-year, 1971–2000, average precipitation amounts for July at Havana and Mason City are 3.87 and 4.04 inches, respectively. The July 2006 network average of 4.02 inches was about 106 percent of the 13-year (1993–2005) July network average of 3.78 inches.

Cook County Precipitation. July 2006 precipitation amounts (Figure 5b) were also variable. Precipitation was heaviest in the southern portion of the network and lightest in the northern region of the network. Precipitation values ranged from 5.25 inches at site #16 (Palos Park), to 2.27 inches at site #1 (Northbrook). The July 2006 network average of 3.63 inches was about 104 percent of the 16-year (1990–2005) July network average of 3.49 inches.

Additional Information: This addendum presents reports on two small, regional, long-term precipitation networks in Illinois. The Imperial Valley Precipitation Network is a 20-site weighing-bucket raingage array operated by ISWS for the Imperial Valley Water Authority since 1992. The network is located in Mason and Tazewell Counties within the most heavily irrigated region of Illinois. Soils here are thick sand-and-gravel deposits associated with the confluence of two major ancient river valleys, the Mississippi and the Mahomet-Teays. The precipitation data help to determine the rate of groundwater drawdown in dry periods and during the growing season, and also the rate at which the aquifer recharges.

The Cook County Precipitation Network is a 25-site weighing-bucket raingage array operated by the ISWS for the USACE since 1989. The network is located in the Lake Michigan and Des Plaines River watersheds of Cook County to provide accurate precipitation measurements for modeling storm runoff, a crucial parameter used to compute the amount of water diverted from Lake Michigan.

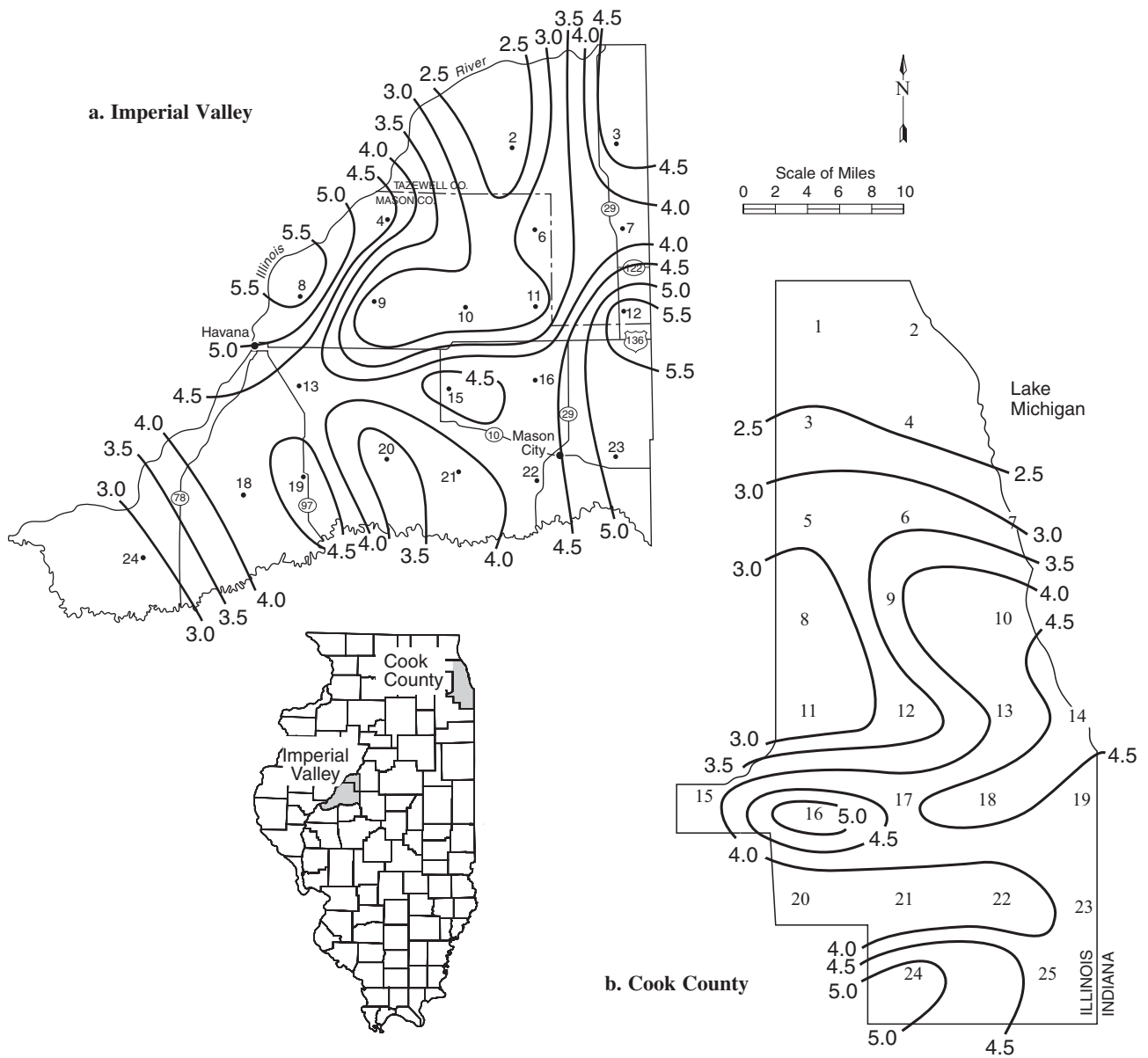


Figure 5. Long-term raingage network precipitation totals (inches) for July 2006

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://mrcc.sws.uiuc.edu/>

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

NWS - National Weather Service, <http://www.nws.noaa.gov/>

USACE - U.S. Army Corps of Engineers, <http://www.rivergages.com>

USGS - U.S. Geological Survey, <http://water.usgs.gov/>

WARM - Water and Atmospheric Resources Monitoring Program, <http://www.sws.uiuc.edu/warm/>

Equal opportunity to participate in programs of the Illinois Department of Natural Resources (IDNR) and those funded by the U.S. Fish and Wildlife Service and other agencies is available to all individuals regardless of race, sex, national origin, disability, age, religion, or other non-merit factors. If you believe you have been discriminated against, contact the funding source's civil rights office and/or the Equal Employment Opportunity Officer, IDNR, One Natural Resources Way, Springfield, IL 62702-1271; 217/785-0067; TTY 217/782-9175.

Illinois WARM Network

▲ SOIL MOISTURE & SOIL TYPE

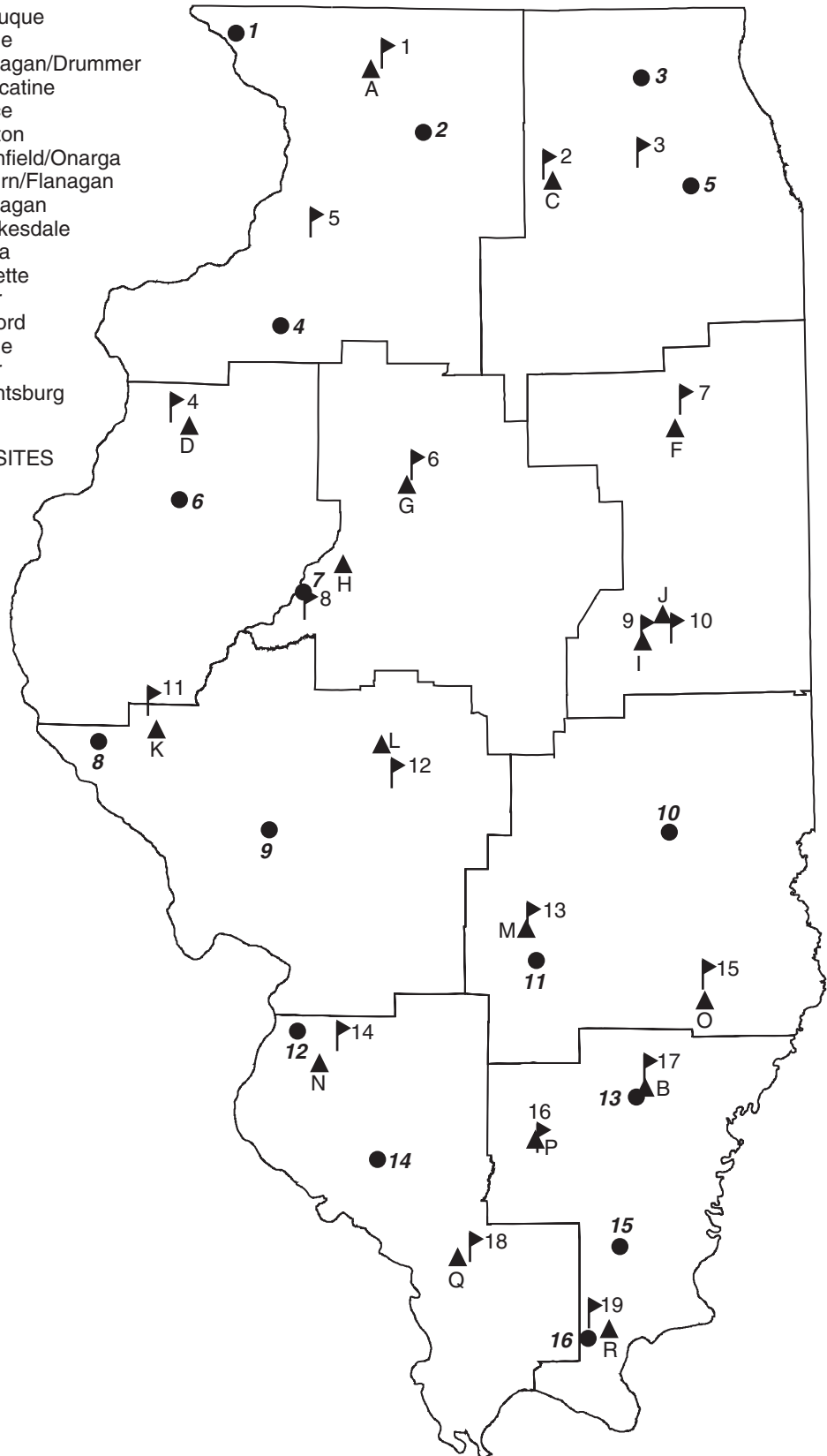
Location: City, County	Soil Type
A Freeport, Stephenson	Dubuque
B Fairfield, Wayne	Cisne
C DeKalb, DeKalb	Flanagan/Drummer
D Monmouth, Warren	Muscatine
F Stelle, Ford	Bryce
G East Peoria, Tazewell	Clinton
H Topeka, Mason	Plainfield/Onarga
I Bondville, Champaign	Elburn/Flanagan
J Champaign, Champaign	Flanagan
K Perry, Pike	Clarksdale
L Springfield, Sangamon	Ipava
M Brownstown, Fayette	Fayette
N Belleville, St. Clair	Weir
O Olney, Richland	Bluford
P Ina, Jefferson	Cisne
Q Carbondale, Jackson	Weir
R Dixon Springs, Pope	Grantsburg

● SHALLOW GROUND WATER SITES

Well Name	County
1 Galena	JoDaviess
2 Mt. Morris	Ogle
3 Crystal Lake	McHenry
4 Cambridge	Henry
5 Fermi Lab	DuPage
6 Good Hope	McDonough
7 Snicarte	Mason
8 Coffman	Pike
9 Greenfield	Greene
10 Janesville	Cumberland
11 St. Peter	Fayette
12 SWS No. 2	St. Clair
13 Boyleston	Wayne
14 Sparta	Randolph
15 S.E. College	Saline
16 Dixon Springs	Pope

▴ CLIMATE NETWORK SITES

GIS#	Station	County
5	Big Bend	Whiteside
9	Bondville	Champaign
19	Dixon Springs	Pope
13	Brownstown	Fayette
11	Perry	Pike
2	DeKalb	DeKalb
4	Monmouth	Warren
8	Kilbourne	Mason
6	East Peoria	Tazewell
12	Springfield	Sangamon
14	Belleville	St. Clair
18	Carbondale	Jackson
15	Olney	Richland
1	Freeport	Stephenson
16	Ina	Jefferson
7	Stelle	Ford
3	St. Charles	Kane
17	Fairfield	Wayne
10	Champaign	Champaign



Illinois WARM Network

● RESERVOIRS

	Name	County
a	Altamont	Effingham
b	Bloomington	McLean
c	Canton	Fulton
d	Carlinville	Macoupin
e	Carlyle	Clinton
f	Coulterville	Randolph
g	Crab Orchard	Williamson
h	Decatur	Macon
i	Devils Kitchen	Williamson
j	Evergreen	Woodford
k	Glenn Shoals	Montgomery
l	Greenfield	Greene
m	Highland	Madison
n	Hillsboro	Montgomery
o	Jacksonville	Morgan
p	Kinkaid	Jackson
q	Lake of Egypt	Williamson
r	Little Grassy	Williamson
s	Mattoon	Coles
t	Mauvaise Terre	Morgan
u	Mt. Olive (old)	Macoupin
v	New Mt. Olive	Macoupin
w	Nashville	Washington
x	Pana	Christian
y	Paradise	Coles
z	Paris (east)	Edgar
aa	Paris (west)	Edgar
bb	Pinckneyville	Perry
cc	Pittsfield	Pike
dd	Raccoon	Marion
ee	Rend	Franklin
ff	Salem	Marion
gg	Shelbyville	Shelby
hh	Sparta	Randolph
ii	Spring	McDonough
jj	Springfield	Sangamon
kk	Taylorville	Christian
ll	Vermilion	Vermilion
mm	Virginia	Cass

▲ RIVER STATIONS

	Discharge
A	Rock River at Rockton
B	Rock River near Joslin
C	Pecatonica River at Freeport
D	Green River near Geneseo
E	Edwards River near New Boston
F	Kankakee River at Momence
G	Iroquois River near Chebanse
H	Fox River at Dayton
I	Vermilion River at Pontiac
J	Spoon River at Seville
K	LaMoine River at Ripley
L	Bear Creek near Marcelline
M	Mackinaw River near Congerville
N	Salt Creek near Greenview
O	Sangamon River at Monticello
P	So. Fork Sangamon near Rochester
Q	Illinois River at Valley City
R	Macoupin Creek near Kane
S	Vermilion River near Danville
T	Kaskaskia River at Vandalia
U	Shoal Creek near Breese
V	Embarras River at Ste. Marie
W	Skillet Fork at Wayne City
X	Little Wabash below Clay City
Y	Big Muddy at Plumfield
Z	Cache River at Forman

	Stage
<i>Illinois River</i>	
AA	Morris
BB	La Salle
CC	Peoria
DD	Havana
EE	Beardstown
FF	Hardin
<i>Mississippi River</i>	
GG	Dubuque
HH	Keokuk
II	Quincy
JJ	Grafton
KK	St. Louis
LL	Chester
MM	Thebes
<i>Ohio River</i>	
NN	Cairo

