

## ILLINOIS WATER AND CLIMATE SUMMARY July 2004

### July 2004 Overview (Bob Scott)

Temperatures in Illinois during July were well below average, the tenth coldest July since 1895. Precipitation was above average. Soil moisture within the top 40 inches of soil was slightly below the long-term statewide average. Mean streamflows were slightly above median heights. Shallow groundwater levels continued to be below long-term average depths.

**Temperatures** across Illinois (Figure 1) for July were well below average (a -2.9-degree departure) uniformly across the state. Crop Reporting District (CRD) temperatures ranged from 2.5 degrees below average (east) to 3.5 degrees below average (west).

**Precipitation** amounts for Illinois in July were above average (Figure 1). The statewide average of 4.66 inches represents a +0.84-inch departure or 122 percent of average. July totals were highest in the east-southeast CRD (6.05 inches or 149 percent of average) and the southwest CRD (5.89 inches or 159 percent of average) and lowest in the northeast CRD (3.05 inches or 81 percent of average).

**Soil moisture** in the 0- to 40-inch (0- to 100-centimeter) layer at the end of July was slightly below normal. Overall, observations showed above normal moisture over northwestern, east-central, and southwestern Illinois, while dry soils were common in central Illinois.

**Mean provisional streamflow** statewide was above the median flow, 141 percent of median (Figure 1). Rivers in Illinois recorded mean discharges in the much above normal to below normal range this month. Peak stages exceeded flood stage at two reporting stations on the Illinois River and one station on the Mississippi River along the Illinois border. The Ohio River at Cairo recorded a peak stage below flood stage.

**Water surface levels** at the end of July were below the normal pool/target operating level at 19 of the 31 reporting reservoirs. Rend Lake remained above its target level, while Lake Shelbyville and Carlyle Lake were just above their seasonal target levels. Lake Michigan's mean level remains below the long-term average.

Statewide, **shallow groundwater levels** continued below normal for the 23rd consecutive month. On average, water-level deviations were 1.8 feet below average for July, 1.3 feet lower than June levels, and 0.5 feet above July levels one year ago.

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

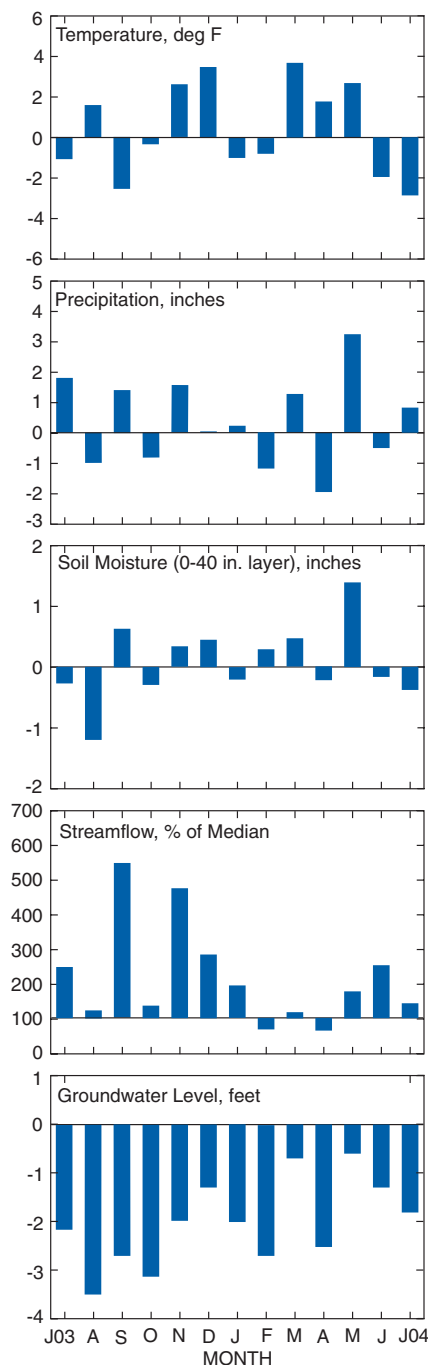


Figure 1.  
Statewide departures from normal

### Contact

Bob Scott: (217) 333-4966, email: [rwscott1@uiuc.edu](mailto:rwscott1@uiuc.edu)  
For more information, see [www.sws.uiuc.edu/warm](http://www.sws.uiuc.edu/warm)

## Weather/Climate Information (Jim Angel and Bob Scott)

**Temperatures** across Illinois for July were well below average (Figure 2 and Table 1), the tenth coldest July since 1895. Regionally, all CRDs ranked within the top 15 coldest Julys on record, with the northwest and northeast CRDs recording the 6th and 7th coldest July, respectively. Extremes ranged from 45°F at Decatur on July 7 to 105°F at Grand Tower (Jackson County) on July 11. Cool temperatures during June and July produced a 2-month departure of 2.3 degrees below average, the 18th coldest June–July since 1895. The 51.8°F year-to-date temperature is close the 51.4°F average temperature.

**Precipitation** for July was above average statewide (Figure 2 and Table 1). However, the northeastern CRD was below average, with only 81 percent of average precipitation. July precipitation was much above average in three of the southernmost CRDs: 10th wettest (southwest CRD), 12th wettest (east-southeast CRD), and 13th wettest (southeast CRD). Bismarck reported the highest one-day precipitation (3.73 inches), and Hutsonville reported the highest monthly total (8.39 inches).

**Severe weather** reported throughout Illinois included 14 tornadoes. No damage occurred when a tornado touched down briefly in Logan County on July 3. Small hail was reported in Randolph County on July 4. No injuries or damage were reported from a series of five weak tornadoes in Whiteside, Madison, Henry, Marion, and Woodford Counties on July 5. There were also several reports of hail and high winds across western and southern Illinois. Hail and high winds were reported across southern Illinois on July 6, with scattered reports in central Illinois on July 9 and July 11. A very stormy day resulted in eight tornadoes in Bureau, Woodford, and McLean Counties, including an F4 tornado that caused several injuries and destroyed a factory near Roanoke on July 13. Widespread reports of damage due to high winds and hail up to 4 inches in diameter occurred from central through east-central Illinois. There were scattered reports of hail and high winds in northwestern Illinois on July 16 and in northeastern Illinois on July 21, with widespread reports of hail and high winds across the state on July 22.

**Illinois Climate Network (ICN) Data.** Average daily wind speeds across Illinois for July (Figure 3) ranged from 3 mph at Dixon Springs to 7 mph at Stelle. Bondville recorded the month's highest wind gusts, 51 mph, on July 13. The prevailing wind direction was southerly in west-central Illinois to westerly in northeastern Illinois. Wind speeds in excess of 8 mph varied from 8 hours at Rend Lake to 268 hours at Stelle. (July has 744 hours.) Average air temperatures ranged from the low to middle 70s north to south across the state.

Solar radiation totals in July reached seasonal maximums, ranging from 633 Mega-Joules per meter squared (MJ/m<sup>2</sup>) at Springfield and Fairfield to 688 MJ/m<sup>2</sup> at Belleville. Potential evapotranspiration observations also were at

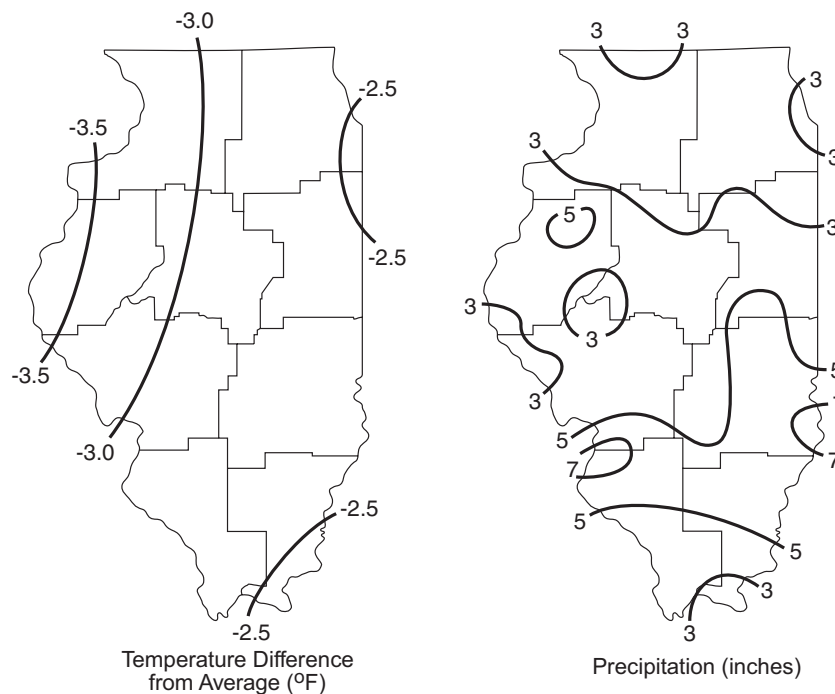


Figure 2. Illinois temperature and precipitation during July 2004

**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		
	Jul 04 Amount	% Avg	Temp Dev	May 04-Jul 04	% Avg	Temp Dev	Feb 04-Jul 04	% Avg	Temp Dev	Aug 03-Jul 04	% Avg	Temp Dev
Northwest	3.69	101	-3.2	14.77	121	-1.0	22.10	112	0.8	35.75	99	1.1
Northeast	3.05	81	-2.7	14.74	125	-1.2	21.44	110	0.5	35.81	98	0.7
West	4.42	108	-3.5	12.84	102	-1.0	18.67	90	0.4	36.36	97	0.6
Central	4.22	108	-2.8	13.63	112	-0.7	19.82	97	0.5	34.69	93	0.6
East	4.27	105	-2.5	15.77	128	-0.6	22.66	110	0.6	40.57	108	0.6
West-southwest	5.00	140	-3.0	13.65	117	-0.6	20.19	98	0.5	39.27	104	0.5
East-southeast	6.05	149	-2.8	15.69	126	0.0	22.65	101	0.9	45.40	111	0.7
Southwest	5.89	159	-2.6	16.70	138	0.0	25.05	109	0.7	41.98	98	0.8
Southeast	5.63	153	-2.6	16.63	133	0.3	24.55	101	0.9	42.32	95	1.0
<b>State Average</b>	<b>4.66</b>	<b>122</b>	<b>-2.9</b>	<b>14.87</b>	<b>122</b>	<b>-0.5</b>	<b>21.79</b>	<b>103</b>	<b>0.7</b>	<b>39.08</b>	<b>101</b>	<b>0.7</b>

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

annual maximums from a low of 5.6 inches at Freeport to just over 6.1 inches at Kilbourne, Belleville, and Rend Lake. Soil temperatures at the 4-inch level ranged from 72°F in northern Illinois to 81°F at Carbondale. Soil temperatures at the 8-inch level ranged from 72°F at Freeport to 78°F at Dixon Springs and Springfield.

Extended climate outlooks issued by the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Climate Prediction Center for August call for equal chances of above, below, and average temperature and precipitation across the state. August–October outlooks call for below average temperatures across northern Illinois, above average precipitation in western Illinois, and equal chances of above, below, and normal temperatures and precipitation across the rest of Illinois.

*Additional Information:* Illinois temperature and precipitation data included in these monthly reports are observed at selected Cooperative Observer Network sites 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) obtains near real-time data via the NWS Remote Observation Surface Automation system. The data reported are provisional. The MRCC obtains complete, quality-controlled data from its parent agency, the National Climatic Data Center (NCDC, NOAA, USDOC) about three months in arrears.

Staff at the ISWS operate the Illinois Climate Network (ICN), a 19-station array of automated weather sites across Illinois. The network provides enhanced temporal weather observations on barometric pressure, air temperature, relative humidity, wind speed and direction, solar radiation, precipitation, and soil temperatures at several depths. Values of potential evapotranspiration and dewpoint temperatures are computed. Sites are located primarily at Illinois community colleges and University of Illinois and Southern Illinois University agricultural experimental farms. Most sensors are polled automatically every 10 seconds, averaged by hour and day, and downloaded to an ISWS computer once a day. Hourly and daily extremes and times of occurrence also are recorded. The daily temperature and precipitation data are added to the MRCC records. These ICN data provide valuable information about extreme and usual weather events, as well as short- and long-term trends in climate data, which may have future direct impacts on other water resources of Illinois.

The Climate Prediction Center (CPC, NOAA, USDOC) produces monthly and seasonal climate outlooks based on statistical and dynamic models. Outlooks for Illinois are extracted and included for our readers.

### Soil Moisture Information (Bob Scott)

Soil moisture throughout all soil layers was near to above normal over much of Illinois at the end of July, a result of the precipitation received over the last several months. However, dry conditions dominated central Illinois (Figure 4). Moisture values in the 0- to 6-inch layer ranged from 195 percent of normal at Rend Lake to 38 percent of normal at Brownstown. Values in the 6- to 20-inch layer exceeded 150 percent of normal at Freeport, Rend Lake, and Carbondale, but soils were very dry at Springfield (less than 10 percent of normal). Soils in the 20- to 40-inch layer

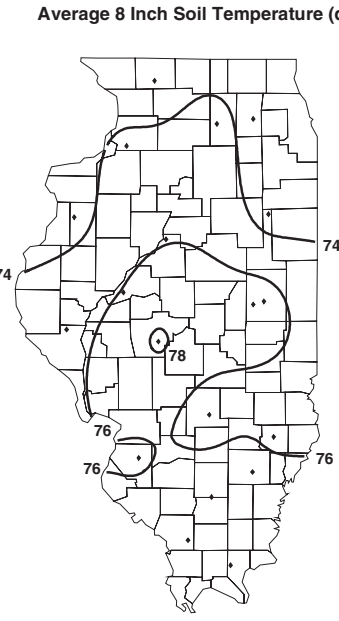
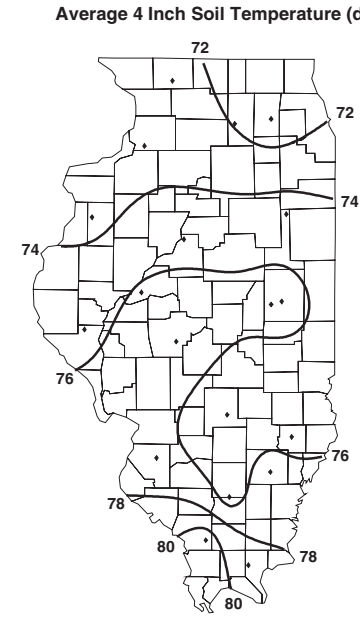
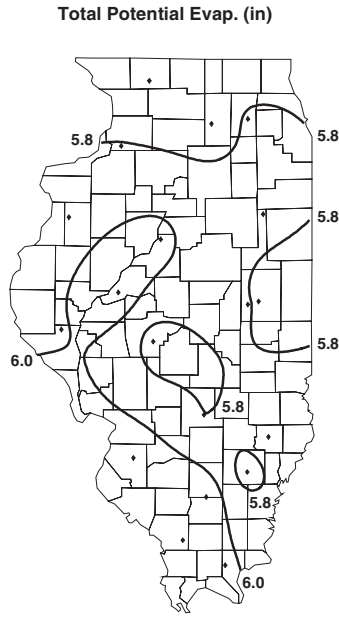
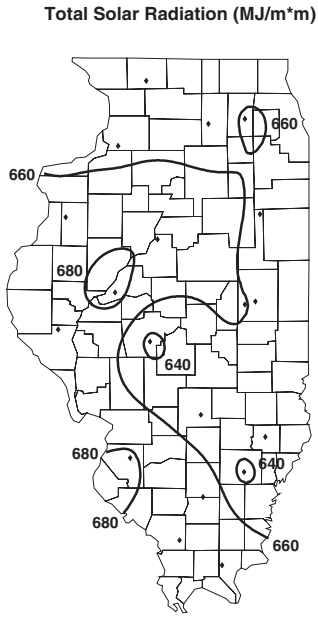
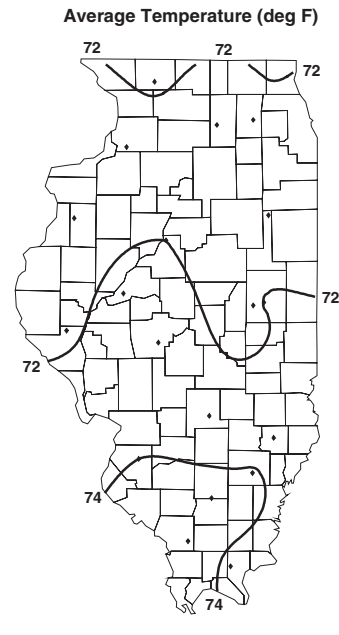
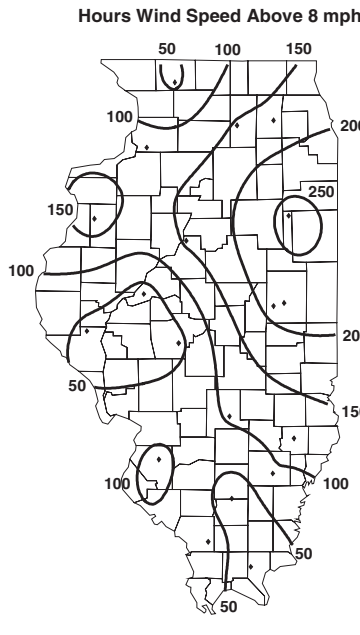
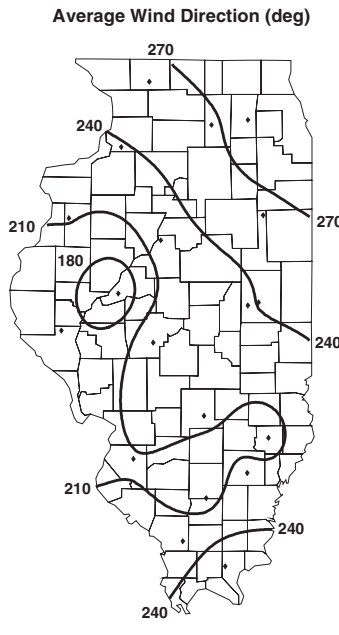
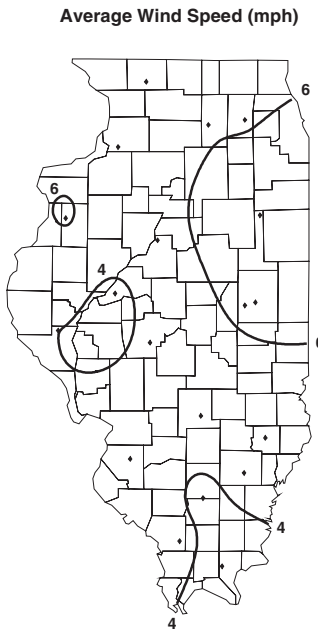


Figure 3. July monthly averages and totals as collected by the Illinois Climate Network

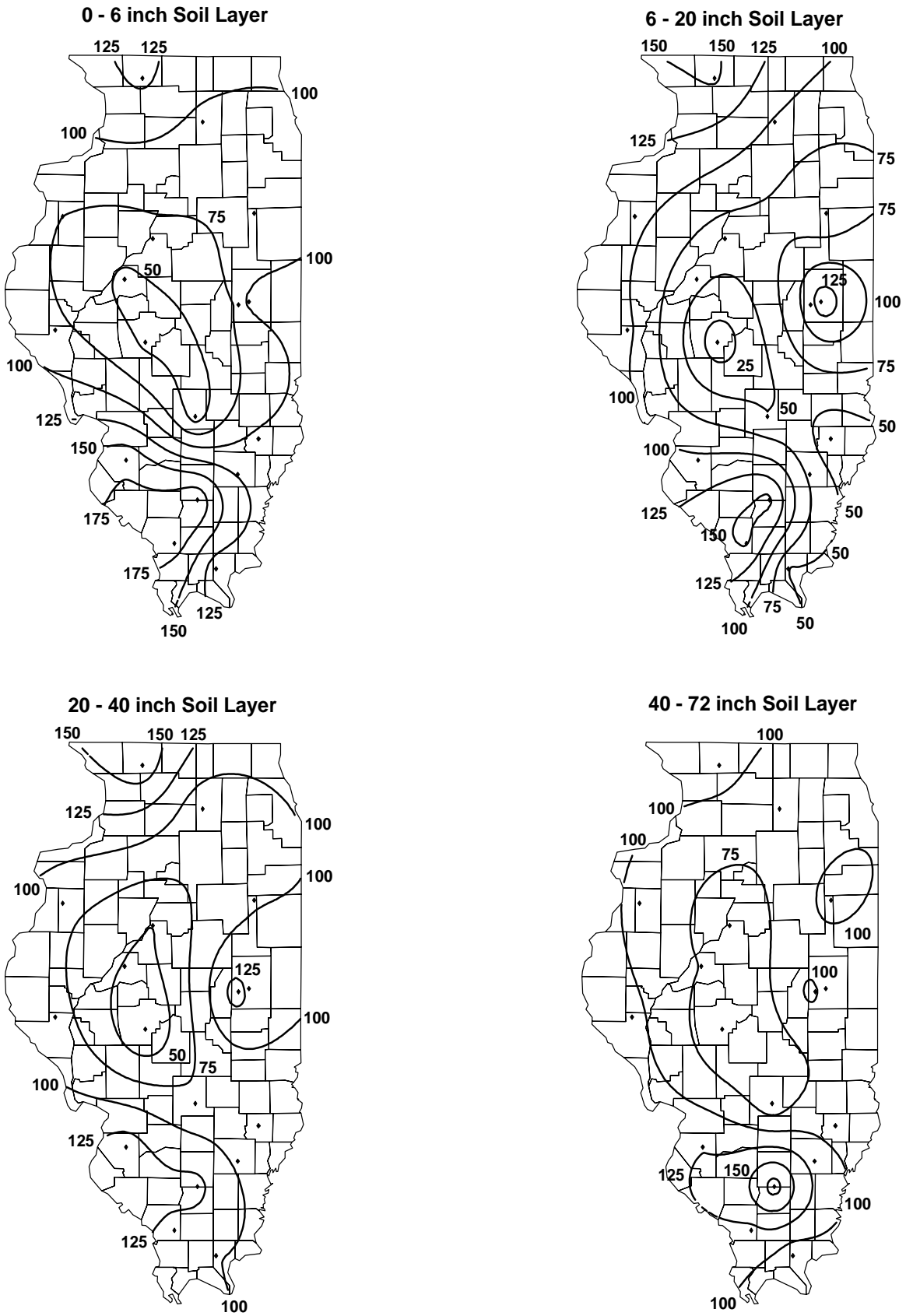


Figure 4. August 1 observed percent-of-normal soil moisture based on 1985-1995 mean

**Table 2. Soil Moisture in Various Layers on August 1, 2004**

<i>Location</i>	<i>Aug. 1 0 - 6 (inches)</i>	<i>Change from July 1 (%)</i>	<i>Aug. 1 6 - 20 (inches)</i>	<i>Change from July 1 (%)</i>	<i>Aug. 1 20 - 40 (inches)</i>	<i>Change from July 1 (%)</i>
Freeport (NW)	1.6	0	4.1	6	6.8	2
DeKalb (NE)	1.6	-19	4.0	-19	6.2	-15
Monmouth (W)	1.4	18	3.5	26	5.5	1
East Peoria (C)	1.0	-40	3.2	-34	6.7	-12
Topeka (C)	0.5	-34	1.5	-25	2.0	-20
Stelle (E)	1.3	-17	3.3	-32	6.1	-12
Champaign (E)	1.7	0	4.8	-1	5.9	-2
Bondville (E)	1.4	2	4.1	8	7.8	7
Perry (WSW)	1.3	-18	4.1	5	6.5	0
Springfield (WSW)	1.2	-9	3.7	-2	6.3	-3
Brownstown (ESE)	0.8	-33	2.2	-32	7.0	-10
Olney (ESE)	1.2	21	3.5	-6	6.7	-3
Belleville (SW)	1.6	-9	3.5	-15	7.9	-3
Carbondale (SW)	1.5	-22	3.0	-29	6.9	-8
Ina (SE)	2.0	47	5.2	11	7.8	2
Fairfield (SE)	1.6	22	4.6	1	7.2	-2
Dixon Springs (SE)	1.4	1	2.9	-26	7.1	-6

were quite moist at Freeport (168 percent of normal) but dry again at Springfield (just 25 percent of normal). Values in the 40- to 72-inch layer ranged from just over 50 percent of normal at Peoria and Springfield to 188 percent of normal at Rend Lake. Overall, soil moisture in Illinois at the end of July was slightly below normal (Figure 1).

Compared to the end of last month, soil moisture in the 0- to 6-inch layer decreased considerably at most sites in northern and central Illinois, while increases were observed at several sites in southern Illinois. Typical changes ranged from 15 to 45 percent (Table 2). Values 6 to 20 inches deep generally decreased as well, dropping 15 to 30 percent at numerous sites, although Monmouth and Ina showed increases. Moisture decreases were predominant in the 20- to 40-inch layer, with changes being less than 20 percent.

*Additional Information:* Soil moisture across Illinois is monitored by ISWS staff at 17 sites mostly co-located with the ICN locations. Data are collected manually from site visits twice a month during the growing season (March–October) and once a month the remainder of the year. That information helps pinpoint areas and extents of unusual soil moisture levels, their impacts on Illinois agriculture, and also provides potential insights on pending trends in other water resources of the state. These data become especially important during periods of prolonged precipitation extremes.

### **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 (ISWS), and the USACE. Provisional discharge data are obtained from direct computer access to the 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 readings posted by the National Weather Service (NWS) and/or the USACE. Two stations on the Illinois River, Beardstown and Hardin, recorded peak stages above flood stage. Stations on Mississippi River along the Illinois border recorded peak stage below flood stage except at Grafton. The Ohio River at Cairo peaked below flood stage on July 1.

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. 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, 50 percent exceedence probability.

**Table 3. Peak Stages for Major Rivers, July 2004**

<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	7.0	04
	La Salle	224.7	20	14.3	01
	Peoria	164.6	18	13.7	01
	Havana	119.6	14	13.9	01
	Beardstown	88.6	14	14.3	01
	Hardin	21.5	25	25.1	01
Mississippi	Dubuque	579.9	17	11.6	01
	Keokuk	364.2	16	12.0	01
	Quincy	327.9	17	15.9	01
	Grafton	218.0	18	19.1	01
	St. Louis	180.0	30	22.0	01
	Chester	109.9	27	24.0	01
	Thebes	43.7	33	28.0	01
Ohio	Cairo	2.0	40	34.7	01

**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.

Mean provisional flow statewide was above the median this month (141 percent of the median) and below the mean (87 percent of the mean). Flows in the northwestern part of the state were in the above normal to much above normal range this month, and the Fox River in northeastern Illinois recorded a mean flow above normal at Dayton. Mean flows above normal were recorded in central Illinois on the Sangamon River at Monticello and the Vermilion River near Danville. The South Fork Sangamon near Rochester was the only station listed in Table 4 with an average monthly flow below normal.

**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 reported in terms of their difference from normal pool (or target level). Reservoir levels are obtained from a network of cooperating reservoir operators who are contacted each month by ISWS staff for the current water levels. 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), and while 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 levels at the end of June at 29 reservoirs, by the end of July the water surface elevation had risen at 4 reservoirs, was the same as last month at 6 reservoirs, and had decreased at 19 reservoirs. Of the 31 reservoirs reporting observations at the end of July, 6 reservoirs had water surface levels above the normal pool (or target operating level), 6 reservoirs were at normal pool, and 19 reservoirs were below normal pool.

*Major Reservoirs.* Water levels at Carlyle Lake and Lake Shelbyville decreased during July, ending the month just above their seasonal target levels. The water level at Rend Lake remained above normal pool although its water level also decreased.

**Great Lakes.** Current month mean and end-of-month values are provisional and are relative to the International Great Lakes Datum 1985. The July mean level for Lake Michigan was 578.6 feet, compared to a mean level of 577.6 feet in 2003. The long-term average lake level for July is 579.5 feet, based on 1918–2002 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 578.6 feet.

*Additional Information:* River stage observations are reported in Table 3 at 14 locations along the Illinois, Mississippi, and Ohio Rivers in terms of the water surface height, registered in feet above the gage datum. The stage of a river is not the same as the depth of its flow. Stage may be converted to a commonly used vertical datum (e.g.,

**Table 4. Provisional Mean Flows, July 2004**

Station	Drainage area (sq mi)	Years of record	2004 mean flow (cfs)	Long-term flows		Flow condition	Percent chance of exceedence	Days of data this month
				Mean*	Median			
Rock River at Rockton	6363	68	9005	3705	2850	much above normal	6	31
Rock River near Joslin	9549	60	12,100	5866	4513	much above normal	10	31
Pecatonica River at Freeport	1326	84	1336	910	681	above normal	14	31
Green River near Geneseo	1003	64	387	566	416	normal	54	31
Edwards River near New Boston	445	65	147	303	170	normal	61	31
Kankakee River at Momence	2294	85	1345	1491	1309	normal	49	31
Iroquois River near Chebanse	2091	79	901	1242	693	normal	43	31
Fox River at Dayton	2642	83	1723	1267	879	above normal	17	31
Vermilion River at Pontiac	579	59	187	320	171	normal	46	31
Spoon River at Seville	1636	86	559	1044	618	normal	55	31
LaMoine River at Ripley	1293	79	333	781	377	normal	52	31
Bear Creek near Marceline	349	58	111	273	100	normal	44	31
Mackinaw River near Congerville	767	54	232	361	220	normal	48	31
Salt Creek near Greenview	1804	61	896	1191	772	normal	43	31
Sangamon River at Monticello	550	90	299	280	163	above normal	29	31
South Fork Sangamon near Rochester	867	53	61.8	377	186	below normal	82	31
Illinois River at Valley City	26,743	64	19,330	21,490	18,756	normal	47	31
Macoupin Creek near Kane	868	74	75.3	324	137	normal	67	31
Vermilion River near Danville	1290	81	1757	754	457	above normal	11	30
Kaskaskia River at Vandalia	1940	33	1088	1319	1158	normal	54	29
Shoal Creek near Breese	735	59	142	311	113	normal	44	31
Embarras River at Ste. Marie	1516	89	572	747	422	normal	42	31
Skillet Fork at Wayne City	464	83	82.9	159	63	normal	47	31
Little Wabash below Clay City	1131	88	306	476	195	normal	43	29
Big Muddy at Plumfield	794	32	383	406	375	normal	47	31
Cache River at Forman	244	79	36.8	87	35	normal	48	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 2002.

**Table 5. Reservoir Levels in Illinois, July 2004**

**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).**

National Geodetic Vertical Datum [NGVD] 1929 or mean sea level) by adding the stage in feet to the gage datum elevation (reported in feet, NGVD 1929). The elevation of the gage datum varies from station to station. Flood stage is typically defined as the level at which a river goes out of its banks.

The USGS publishes long-term mean streamflows for each month. The month's median flow for 26 stations listed in Table 4 is determined by ranking the current month's mean flow for each year of record and then selecting the middle value, 50 percent exceedence probability. 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 "much above normal" to "much below normal" are a relative stratification of current conditions and are defined in the notes following Table 4. Figure 1 presents the statewide average of the computed percentages of median streamflow for the stations. With very few exceptions, the median flow for a particular month will be less than the mean flow at the 26 reporting stations. 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 for the current water levels. The ISWS started collecting month-end water surface elevations at reservoirs in 1983. The number of reporting stations has increased over time. The current month's average month-end water surface elevation for each reservoir is the arithmetic average of the month-end levels for the period of record. The number of years of data also is tabulated.

## Groundwater Information (Ken Hlinka)

**Comparison to Normal Levels.** Shallow groundwater levels for July in 16 observation wells, which are remote from pumping centers, overall averaged 1.8 feet below normal (15-year average) and ranged from 21.8 feet below average to 3.6 feet above average (Table 6). Generally, deviations were greatest in northern Illinois and less than a foot in the southern half of the state.

**Comparison to Previous Month.** Shallow groundwater levels averaged 1.3 feet below those of June, ranging from 11.9 feet lower to 1.3 feet higher.

**Comparison to Same Month, Previous Year.** Shallow groundwater levels in July averaged 0.5 feet above levels of a year ago, ranging from 6.7 feet lower to 10.1 feet higher. The greatest deviations were observed in northern Illinois.

**Table 6. Month-End Shallow Groundwater-Level Data Sites, July 2004**

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	25.00	20.20	+0.32	+0.73	-0.27	+1.39
2	Mt. Morris	Ogle	55.00	21.91	-5.81	-4.27	+1.20	+10.10
3	Crystal Lake	McHenry	18.00	1.12	+3.58	+3.90	-0.41	+4.88
4	Cambridge	Henry	42.00	31.72*	-21.77	-22.35	-11.97	-6.73
5	Fermi Lab	DuPage	17.00	7.96	-0.44	-0.40	-1.86	+0.04
6	Good Hope	McDonough	30.00	5.96	+0.30	+1.53	-0.67	+0.34
7	Snicarte	Mason	42.00	38.01	-1.68	-1.50	-0.15	+0.08
8	Coffman	Pike	28.00	13.09	-1.66	-0.60	-1.01	-2.75
9	Greenfield	Greene	20.70	12.28	-0.51	-0.48	-3.01	+0.61
10	Janesville	Cumberland	11.00	5.86	-0.18	+0.04	-0.06	+0.34
11	St. Peter	Fayette	15.00	4.39	-0.40	-0.20	-0.43	-0.83
12	SWS #2	St. Clair	80.00	N/A	N/A	N/A	N/A	N/A
13	Boyleston	Wayne	23.00	5.85	-0.64	-0.18	+0.67	-0.95
14	Sparta	Randolph	27.00	6.61	-0.03	+1.13	-1.81	-0.77
15	SE College	Saline	10.19	6.01	+0.56	+0.41	-0.30	-1.05
16	Dixon Springs	Pope	8.63	7.41	-0.92	-2.63	-1.91	-0.31
17	Bondville	Champaign	21.00	3.68	+0.69	+0.75	+1.30	+1.39
Averages					-1.79	-1.51	-1.29	+0.49

**Notes:**

N/A = Data not available.

\*Lowest level of record for July.

*Additional Information:* The ISWS operates a network of 17 shallow groundwater monitoring wells sited in rural locations. Wells are remote from pumping stations so that both short- and long-term trends in water-table levels under natural conditions can be assessed. These data help us understand the effects and extent of phenomena such as droughts and floods in Illinois and, in particular, their lingering impacts on the shallow groundwater resources of the state.

## Addendum

### Long-Term Precipitation Networks (Nancy Westcott)

**Imperial Valley Precipitation.** July 2004 precipitation amounts (Figure 5a) were variable. Gage amounts were greatest in the southern and eastern areas of the network, and lightest in the northwestern portion of the network. Individual gage totals ranged from 4.22 inches at site #22 to 0.75 inches at site #4. 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 2004 network average of 2.30 inches was about 56 percent of the 11-year (1993–2003) July network average of 4.11 inches.

**Cook County Precipitation.** July 2004 precipitation amounts (Figure 5b) also were variable. Precipitation was greatest in the east-central portion of the network and lightest in the northwestern and southeastern parts of the network. Precipitation values ranged from 5.47 inches at site #14 (79th Street) to 1.56 inches at site #8 (Westchester). The July 2004 network average of 3.27 inches was about 91 percent of the 14-year (1990–2003) July network average of 3.61 inches.

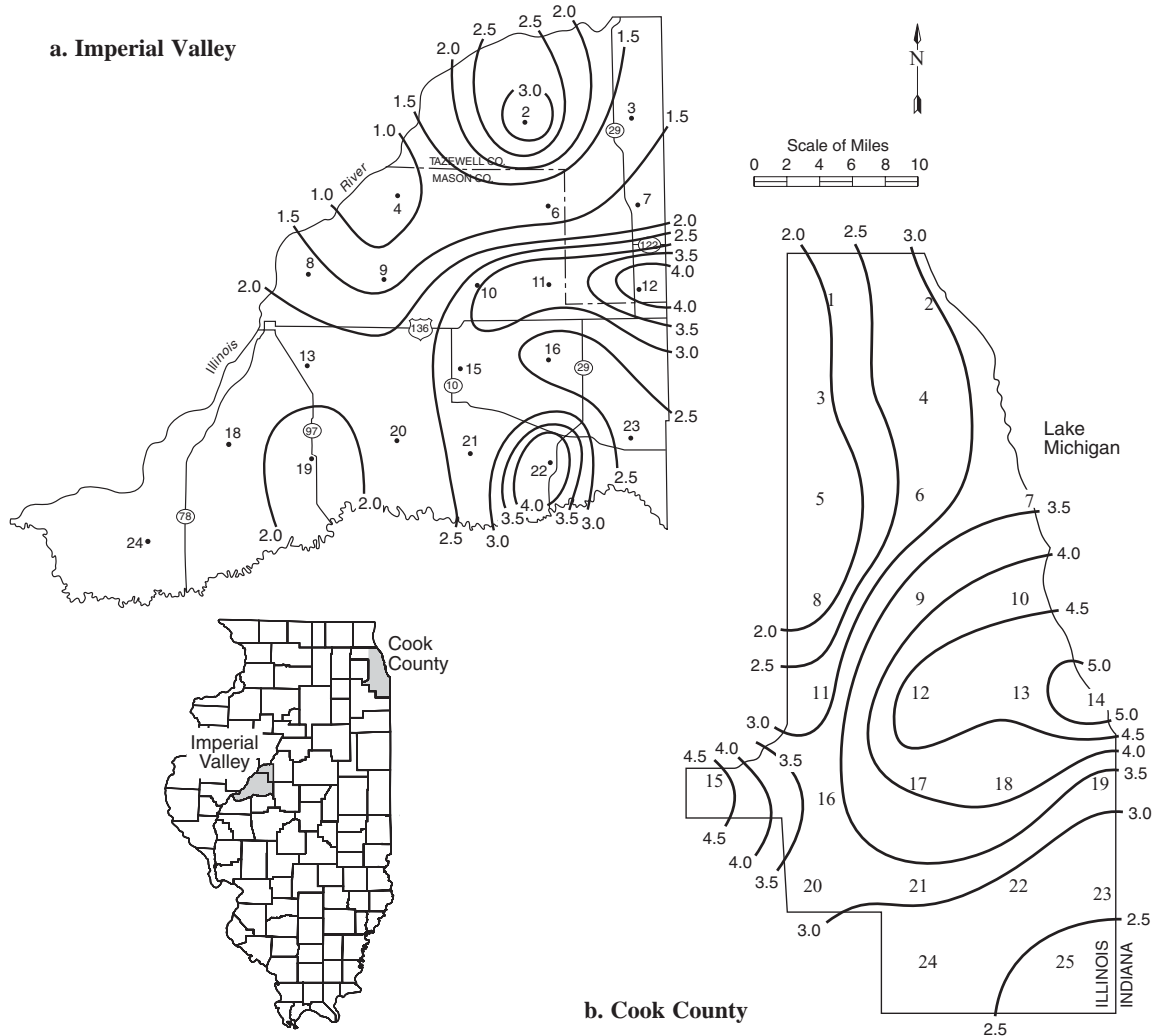


Figure 5. Long-term raingage network precipitation totals (inches) for July 2004

*Additional Information:* The addendum reports on two small, regional, long-term precipitation networks in Illinois. The ISWS has operated the Imperial Valley Precipitation Network, a 20-site weighing-bucket raingage array, 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. These precipitation data help determine the rate of groundwater drawdown in dry periods and during the growing season, and the rate of aquifer recharge.

The ISWS has operated the Cook County Precipitation Network, a 25-site weighing-bucket raingage array, 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 in computing the amount of water diverted from Lake Michigan.

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 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/>