

Illinois Drought Update, April 20, 2006
DROUGHT RESPONSE TASK FORCE
Illinois State Water Survey, Department of Natural Resources

1. DROUGHT STATUS. According to the U.S. Drought Monitor (Figure 1), portions of western Illinois along the lower Illinois River and northeastern Illinois in the Chicago area remain in a “moderate” drought (category 1 in their 4-category drought classification). Much of northern, western, and southwestern Illinois are considered “abnormally dry”. Water Survey scientists suggest that the D1 remnants in Illinois related to the 2005 drought should be removed at this time. While long-term precipitation deficits remain in northern and western Illinois, a wet start to 2006 has allowed for significant recovery in recent weeks (see next section). For all practical purposes, the direct regional impacts of the 2005-06 drought are over (see following sections). The U.S. Drought Monitor considers east-central and southeastern Illinois to be free of drought. Water Survey scientists concur.

Moderate to severe drought extends throughout the southern third of Iowa and much of Missouri with more serious drought concerns in the southern Great Plains and the southwestern U.S. The broad band of drought from Texas to the Great Lakes has been in place to some degree since last May. The Drought Monitor is updated each Thursday morning at 8am EDT and can be accessed via the Internet at <http://www.drought.unl.edu/dm/monitor.html>.

Residual vulnerability still exists in deep soil moisture layers and shallow groundwater zones in Northern Illinois, so conditions may deteriorate more rapidly than normal during summer dry spells. Despite this somewhat increased vulnerability, there is currently only a normal probability of drought in Illinois this summer, not the enhanced probability that had been anticipated in recent months.

2. PRECIPITATION. Statewide precipitation in 2006 through April 19 has been 11.40 inches, which is 2.03 inches (or 22 percent) above normal. Both March and April have been particularly wet. March finished with 4.77 inches, compared to a normal of 3.21 inches. April has 3.01 inches of precipitation already in the first 19 days, compared to a normal of 2.31 inches at this point in time. Precipitation amounts and departures for 2006 are shown in Figure 2. Going back to the beginning of the drought, statewide precipitation since March 1, 2005 (Figure 3) has been 35.57 inches (8.74 inches or 20% below normal). Precipitation deficits were most severe in northern and western Illinois. However, since January 1, 2006, Rockford received 10.73 inches (3.60 inches above normal); Chicago, 9.38 inches (1.11 inches above normal); Moline, 11.50 inches (3.30 inches above normal); Peoria, 9.66 inches (1.36 inches above normal); Quincy, 6.88 inches (1.33 inches below normal); Springfield, 10.67 inches (2.08 inches above normal); and Champaign-Urbana, 9.66 inches (0.28 inches above normal); Carbondale, 16.93 inches (4.94 inches above normal).

3. LAST 100 YEARS. The accumulated precipitation deficits that began in March 2005 showed a large change in March 2006. Statewide precipitation totals during those 13 months were the 7th driest March – March period in Illinois since 1895 (Figure 4). This total is up from 3rd driest given in the last report one month ago. Furthermore, during the first 3 weeks of April, statewide

precipitation averaged approximately 3 inches, which may have moved the current drought period out of the top ten driest on record.

The driest period of the current drought statewide was March through June 2005. Precipitation totals during the 9 months that followed, July 2005 – March 2006, were closer to normal, ranking only as the 39th driest over the last 110 years of record. Likewise, regional precipitation totals during the 13 months since March 2005 show some climate districts that on March 31 remained in the top ten driest since 1895. However, since July 2005, no district's precipitation total ranks worst than 20th driest (west), while climate districts in southern Illinois have reported above normal rainfall during the last 9 months. Continuation of tables showing accumulated precipitation deficits since the beginning of the drought to the present may present a view of current water conditions in the state that is too pessimistic.

4. SOIL MOISTURE. Normal to above normal precipitation across Illinois in March and the first half of April has brought soil moisture in the state closer to normal conditions on April 15 (Figure 5). Observations at most sites in the top 40 inches of soil are somewhat below normal in northwestern and western Illinois. Precipitation since April 15 may have provided further amelioration of these near surface conditions

5. GROUNDWATER CONDITIONS. The ISWS maintains a long-term, statewide shallow observation well network to observe groundwater level response to climatological conditions remote from the influence of pumping wells. Based on hand-measurements made at the end of March in 16 of these observation wells, shallow groundwater levels were below normal by an average of 1.4 feet and ranged from 10 feet below to 3.7 feet above. Water levels in the central and southwest part of the state are above average levels, but levels are far below in the West-Southwest Crop Reporting District. Although all but one station (Boyleston, Wayne County) have experienced increases since February, most stations continue to be below March 2005 levels (2.2 feet below).

We have received no indications over the last month of low groundwater conditions reflected in public requests for information. Recent rainfall apparently has brought some relief to the large-diameter bored well problems of the recent past in central and eastern portions of the state.

The ISWS ICN Observation Well Network, a series of shallow wells stationed at sixteen ICN sites collecting hourly groundwater level measurements, is reporting increases in nine of the sixteen wells from March 1 through April 20, 2006. Groundwater levels in wells in the northern half of the state have been increasing, whereas, declines are noted in the southern half of Illinois.

6. ILLINOIS STREAMFLOWS. Most of the streams in Illinois are now at normal flow levels for April, as shown in Figure 6 for the period from April 1-18. Data from the 27 gaging locations included in Figure 6 indicate that only the Green and Kankakee Rivers in northern Illinois are at below-normal flow levels (lowest 30th percentile). In contrast, several streams in the southeastern portion of Illinois are experiencing above-normal flow levels (highest 30th percentile).

Streams in north-central Illinois still have a tendency for below-average flows, even following recent periods of above-average precipitation. However, flow conditions are much improved over previous months and it appears unlikely that these areas would experience a return to much-below-normal flows without an extended period of below normal precipitation in the upcoming spring or summer.

7. WATER LEVELS AT PUBLIC WATER SUPPLY (PWS) RESERVOIRS. The Water Survey maintains monthly lake level records for 35 public water supply reservoirs in Illinois. Of these, 15 reservoirs have records that date back to the 1980s and have a relatively consistent level of water use from which the impacts of different drought periods can be compared. Twelve of these 15 reservoirs are now at or near full pool, which is normal for this time of year. Three reservoirs, listed in Figure 7, were still below their normal condition (full-pool) during the period of measurement (April 17-19). Only Altamont Lake, which is currently at about 80% of capacity, still poses a water supply concern. Preliminary analysis indicates that the capacity and surface area of Altamont Lake are roughly 30% lower than previously estimated, in turn affecting the expected water supply yield of the lake.

8. FEDERAL RESERVOIRS. Lake Shelbyville and Carlyle Lake are currently 2.1 and 0.1 feet, respectively, above their seasonal target level and have been releasing water to bring their water levels down. Rend Lake, at 4 feet above its primary spillway elevation, is at a level that is normal for this time of year.

9. MISSISSIPPI AND OHIO RIVERS. The water levels in the Ohio River and the Mississippi River are generally at a normal condition for this time of year. Most reaches of these rivers are slightly below the long-term median for mid-April, although the uppermost reaches of the Mississippi River (along the northern half of Illinois) are near the 70th percentile indicating above-average flows.

10. ILLINOIS RIVER. Although the upper part of the Illinois River in northeastern Illinois is currently experiencing above-average flows in response to mid-April rainfall, in general the river's flows over the past month fall within normal expected conditions for this time of year.

11. LAKE MICHIGAN. Over the past month, the water level for Lake Michigan has risen 0.3 feet, following its typical seasonal pattern. The lake is now 0.4 foot lower than it was one year ago; 1.3 feet lower than its long-term April average,; and 1.4 foot higher than the record April low that occurred in 1964.

12. OUTLOOK. Following the recent weakening of the La Niña event in the eastern equatorial Pacific and the return of sea surface temperatures to near normal, the federal Climate Prediction Center (CPC) has taken a quite optimistic viewpoint in the latest U.S Drought Outlook that was released April 20 (Figure 8). While there is no direct forecast for above normal precipitation in Illinois in the CPC seasonal forecast, it is expected that Illinois will have normal precipitation probabilities during the next three months, making continuing drought recovery likely. A comparison with other dry periods in Illinois similar to 2005-2006 also indicates that the improvement to date this spring has reached a point when further recovery is more likely than renewed decline (Figure 9).

According to the National Weather Service, precipitation is expected to be near normal during April 20-25, but below normal from April 26-May 3, while temperatures will be mild. The month of May will be a key indicator as to the moisture regime of the coming summer. Should below normal rainfall occur in May, this may also indicate that summer will be predisposed to drier than normal conditions. Also, while the Pacific SST forcing has dissipated, there is still a strong existing drought in the Southern Great Plains that could influence weather patterns downstream over the Midwest if a semi-permanent high pressure ridge develops. One tool generated by the CPC, an ensemble of many runs with the Climate Forecast System model, still indicates an enhanced probability of dryness during May through July from the Great Plains to Illinois. However, the CPC itself discounted this tool in its forecasts, as its ability to predict skillfully during summer is limited. Finally, a constructed analog of soil moisture from CPC and an examination of two years like the current one by State Climatologist Jim Angel both indicate that there is little increased risk of drought compared to normal.

13. SUMMARY OF STATE'S WATER RESOURCES. Data at the end of March indicate that most water resources in Illinois responded positively to recent increases in precipitation (Figure 10). Statewide departures from normal of soil moisture, streamflow, and shallow groundwater levels have decreased. Streamflow values edged above 100% of median for the first time in one year. Shallow groundwater levels are at their highest point since last August, and less than half of the greatest departure seen in December.

Report Prepared by:

Derek Winstanley, Chief of the Illinois State Water Survey - (217) 244-5459

dwinstan@uiuc.edu

Jim Angel, State Climatologist - (217) 33-0729

jimangel@uiuc.edu

Mike Palecki, palecki@uiuc.edu

Vern Knapp, Center for Watershed Science - (217) 333-4423

vknappp@uiuc.edu

Amy Russell, Center for Watershed Science - (217) 333-3889

russell@uiuc.edu

Al Wehrmann, Director, Center for Groundwater Science - (217) 333-0493

alex@uiuc.edu.

Ken Hlinka, Center for Groundwater Science - (217) 333-8431

khlinka@sws.uiuc.edu

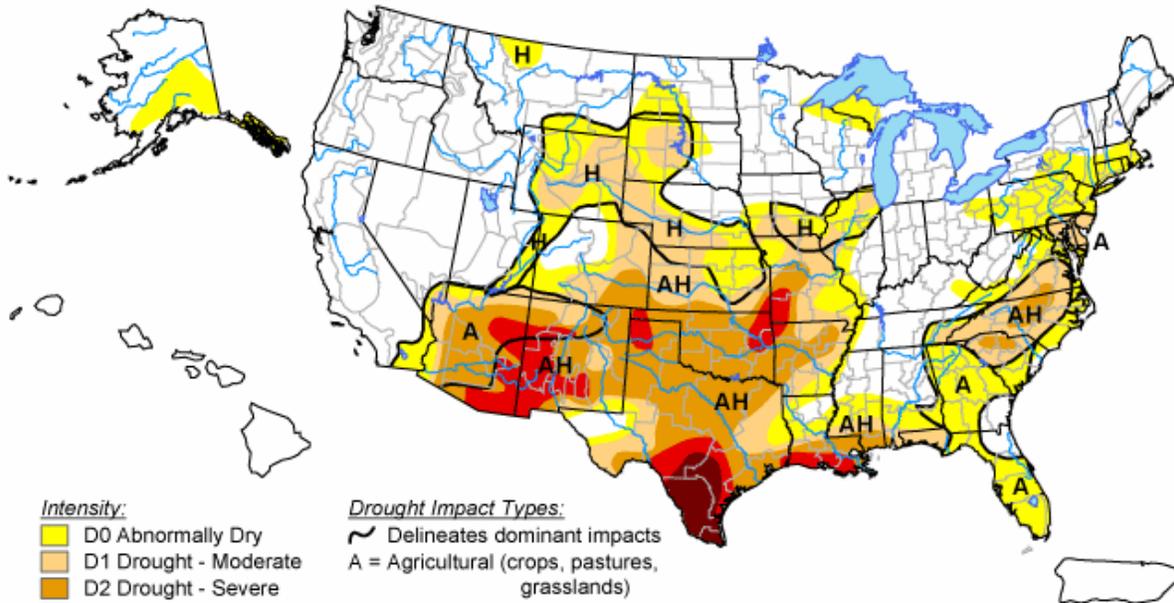
Bob Scott, Office of the Chief - (217) 333-4966

rwscott1@uiuc.edu

Water Survey Web site: <http://www.sws.uiuc.edu/hilites/drought/>

U.S. Drought Monitor

April 18, 2006
Valid 8 a.m. EDT



Intensity:

- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional

Drought Impact Types:

- Delineates dominant impacts
- A = Agricultural (crops, pastures, grasslands)
- H = Hydrological (water)
- (No type = Both impacts)

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

<http://drought.unl.edu/dm>



Released Thursday, April 20, 2006
Author: Rich Tinker, CPC/NCEP/NWS/NOAA

Figure 1. U.S. Drought Monitor for April 18, 2006.

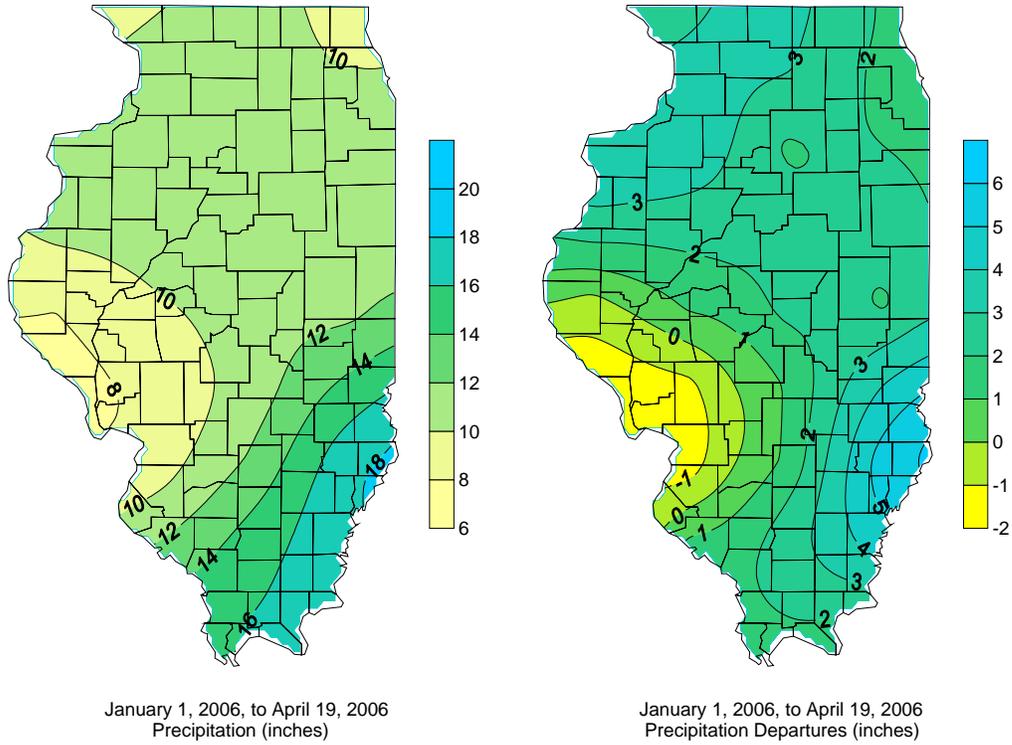
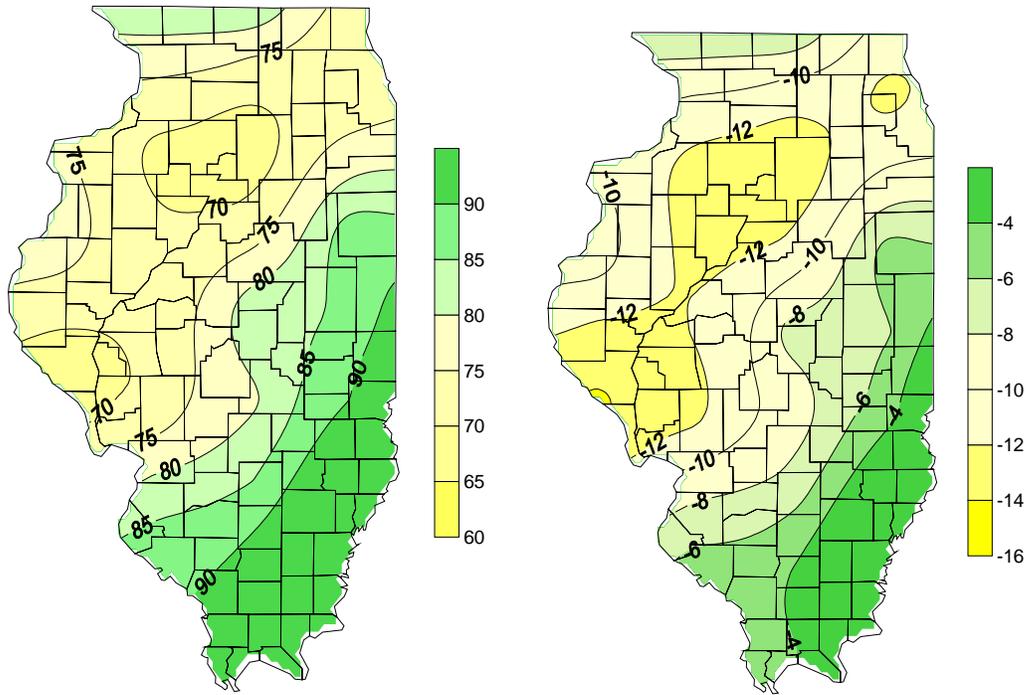


Figure 2. Precipitation for the period of January 1, 2006 to April 19, 2006, in terms of actual precipitation (left) and departure from normal (right).

Source: Illinois State Water Survey



March 1, 2005, to April 19, 2006
Precipitation Percent of Normal

March 1, 2005, to April 19, 2006
Precipitation Departures (inches)

Figure 3. Precipitation for the period of March 1, 2005 to April 19, 2006, in terms of percent of normal (left) and departure from normal (right).

Source: Illinois State Water Survey

Figure 4. Ten driest March through March periods (13 months) in Illinois (since 1895).

<i>Rank</i>	<i>Year</i>	<i>Precip (in)</i>
1	1930-31	25.66
2	1901-02	28.92
3	1914-15	29.86
4	1953-54	30.76
5	1940-41	30.83
6	1988-89	32.27
7	2005-06	32.38
8	1963-64	33.28
9	1956-57	33.46
10	1971-72	33.54

Source: Illinois State Water Survey

0 - 72 inch Soil Layer

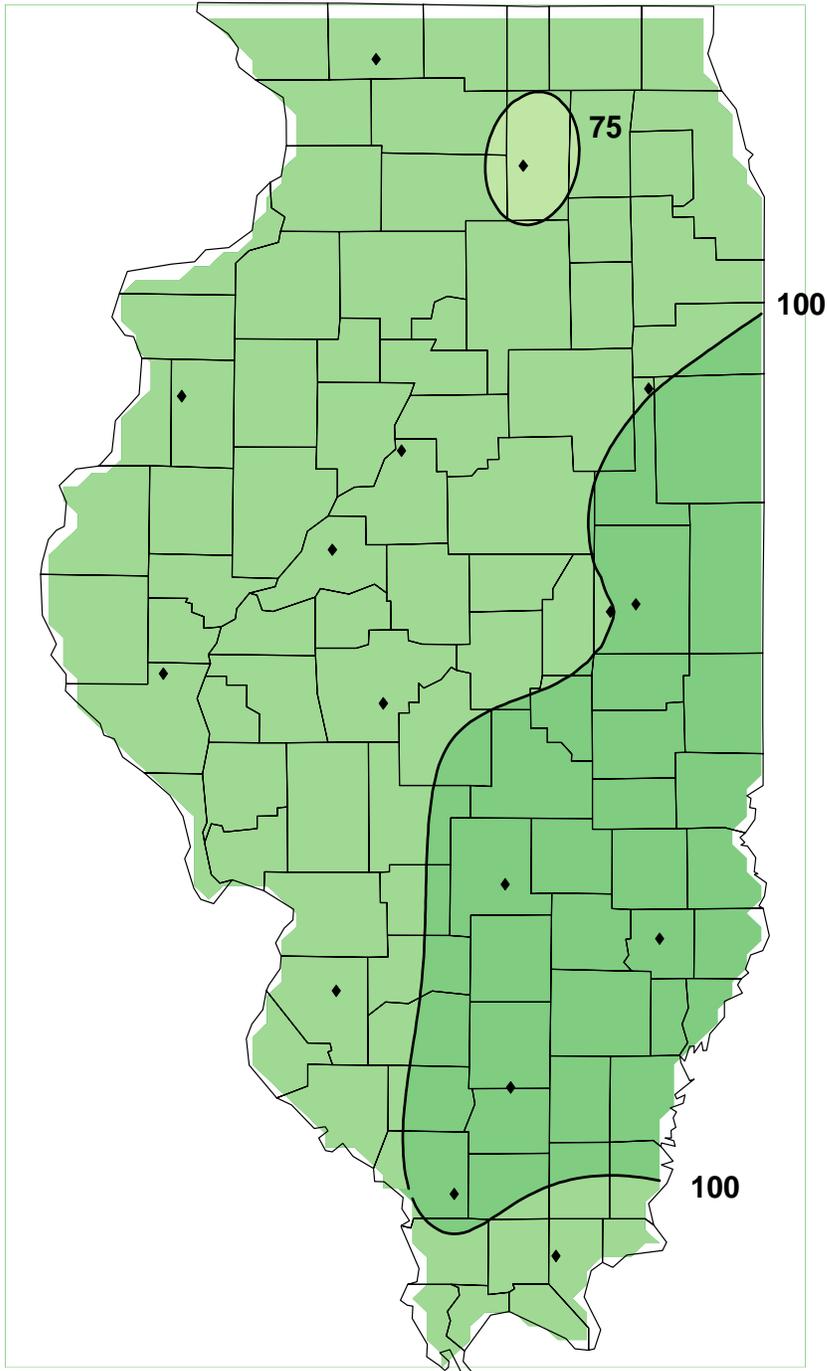
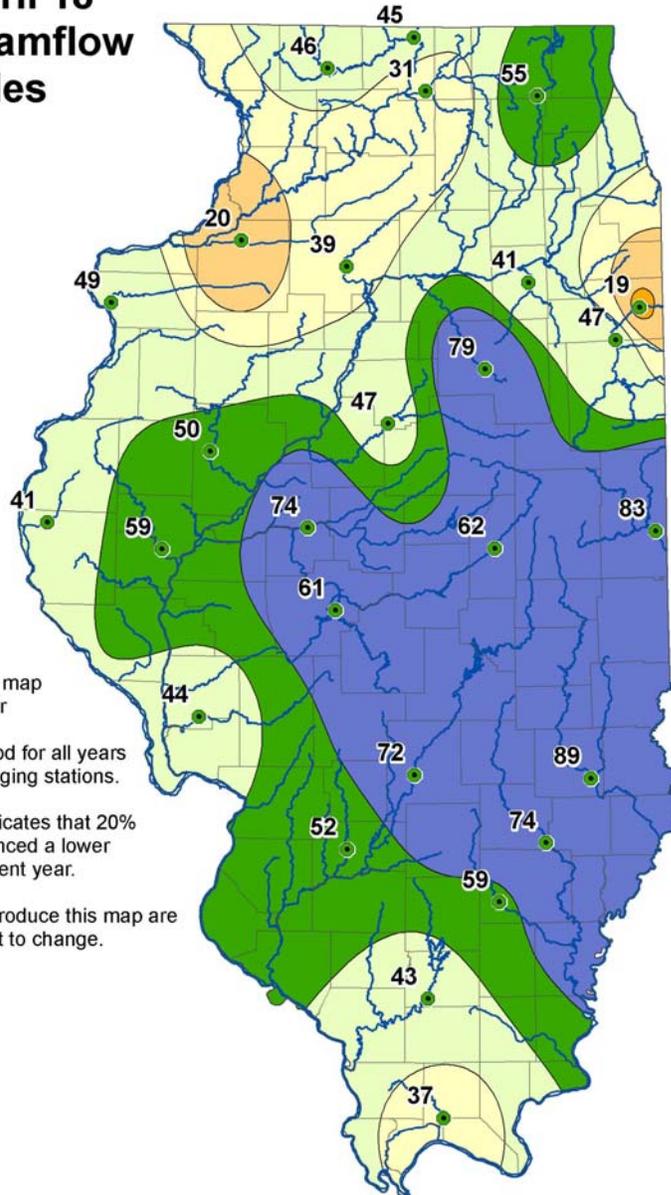
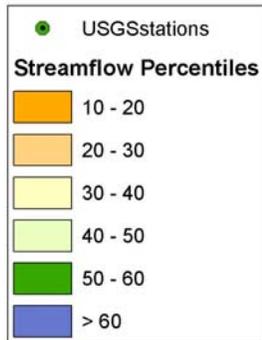


Figure 5. April 15, 2006 observed percent of normal soil moisture based on 1985-1995 mean.

Source: Illinois State Water Survey

April 1 - April 18 Average Streamflow Percentiles



The percentage values on this map describe Illinois streamflows for April 1, 2006 - April 18, 2006, as compared to the same period for all years of record at selected USGS gaging stations.

For example, a value of 20 indicates that 20% of the years on record experienced a lower total flow amount than the current year.

The streamflow data used to produce this map are provisional and may be subject to change.

Illinois State
WATER
Survey (1895)



0 15 30 60
Miles

1:3,000,000

Figure 6. Streamflow Percentiles for April 1-18, 2006.

Figure 7. Mid-April 2006 Water Levels at Selected PWS Reservoirs.

<u>Reservoir</u>	<u>Current reservoir drawdown</u>	<u>Beginning of ISWS lake record (year)</u>	<u>This month's rank</u>	<u>Lowest April level on record (year)**</u>	<u>Median April level**</u>
Altamont Lake	-2.7 ft	1983	3	-4.2 ft (2003)	full pool
Evergreen Lake	-2.0 ft	1988	4	-13.9 ft (1989)	full pool
Canton Lake	-0.8 ft	1989	7	- 9.6 ft (1990)	full pool

* The remaining 12 PWS reservoirs with long term records are at full pool.

**Median and lowest April values are estimated using end-of-month historical values. This month's rank is based on an assumption that lake levels will not change over the remainder of the month.

Source: Illinois State Water Survey

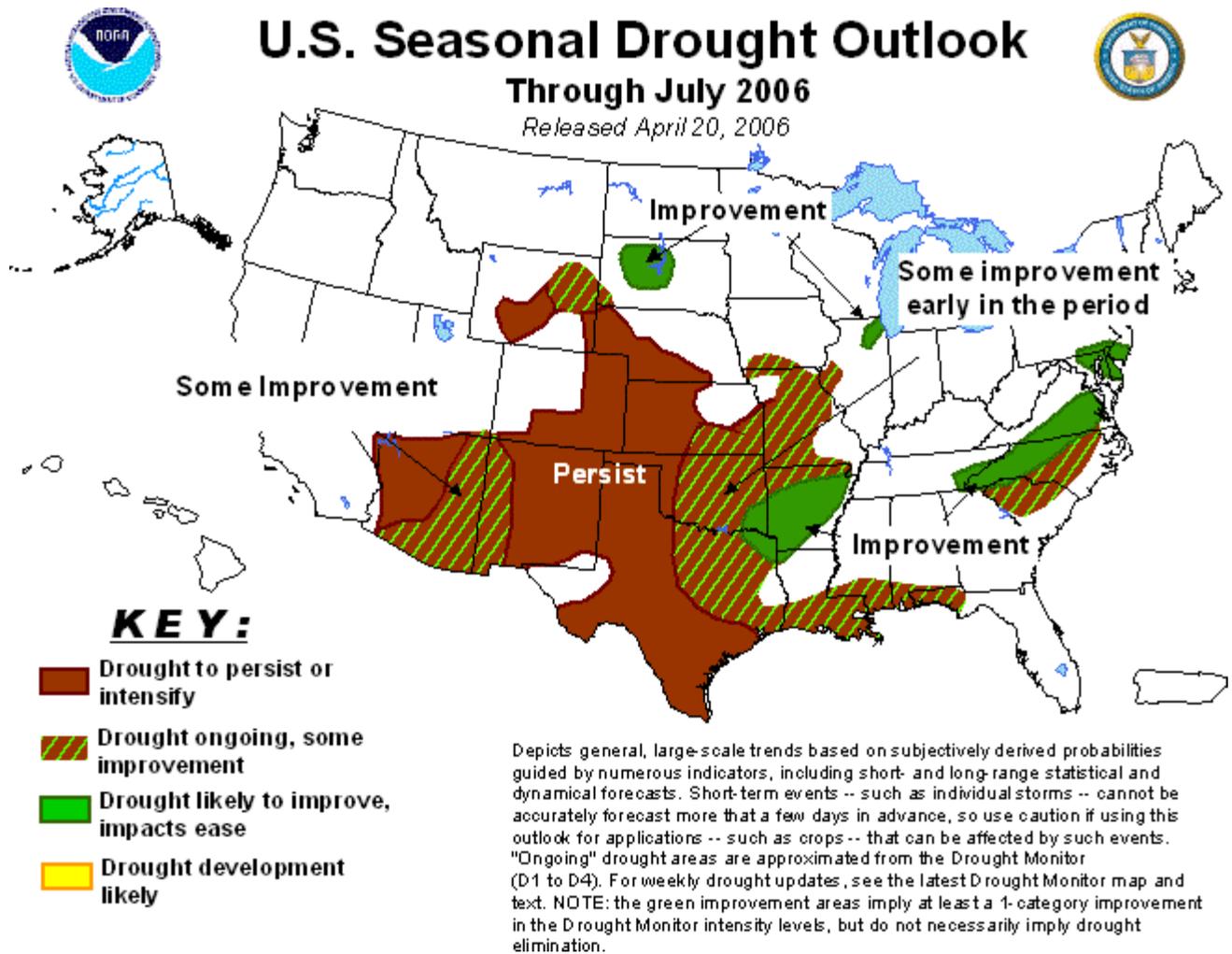


Figure 8. U.S. Climate Prediction Center Drought Outlook through July 2006.
http://www.cpc.ncep.noaa.gov/products/expert_assessment/season_drought.gif

Illinois - Climate Divisions 1, 2, 4

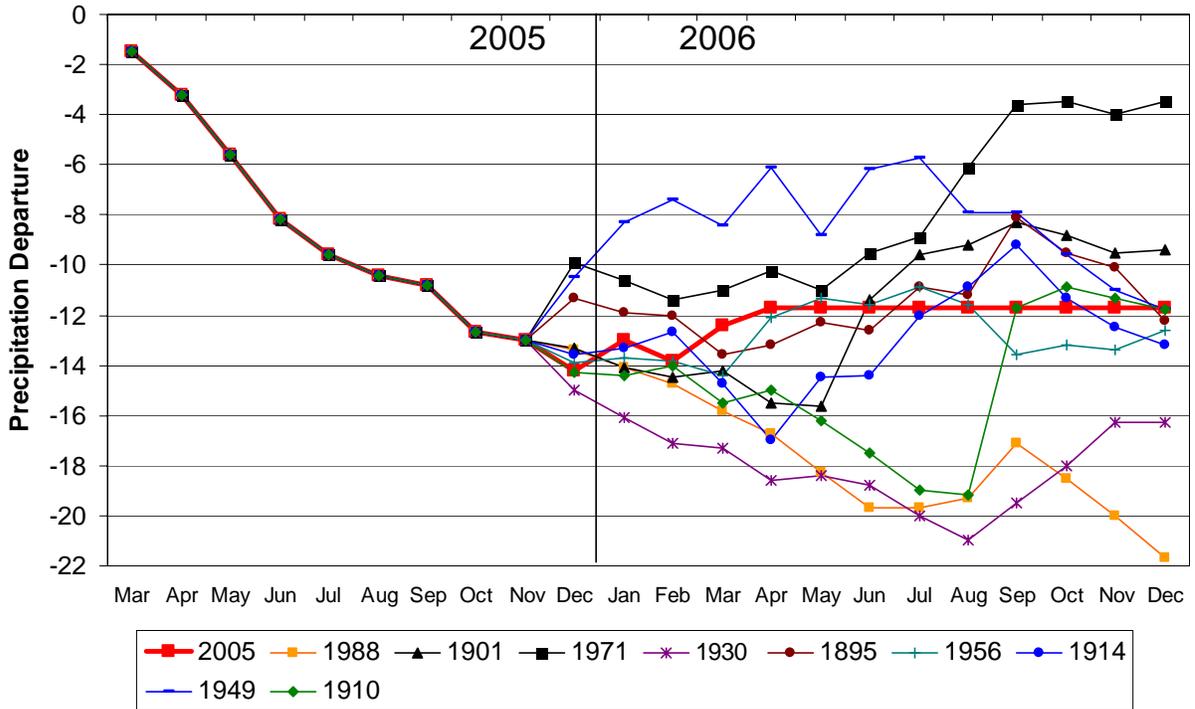


Figure 9. The Northern Illinois cumulative precipitation departure from normal (inches) for March 2005 through April 2006 is compared to the actual months that followed during the other 9 driest March through November periods. April 2006 data are current only through the 19th. The red line for 2005-2006 is extended to December 2006 using normal monthly precipitation. The Northern Illinois average combines precipitation from the Northwest (Div 1), Northeast (Div 2), and Central (Div 4) climate divisions of Illinois. A map of Illinois climate divisions is located at: <http://www.ncdc.noaa.gov/img/onlineprod/drought/il.gif>.

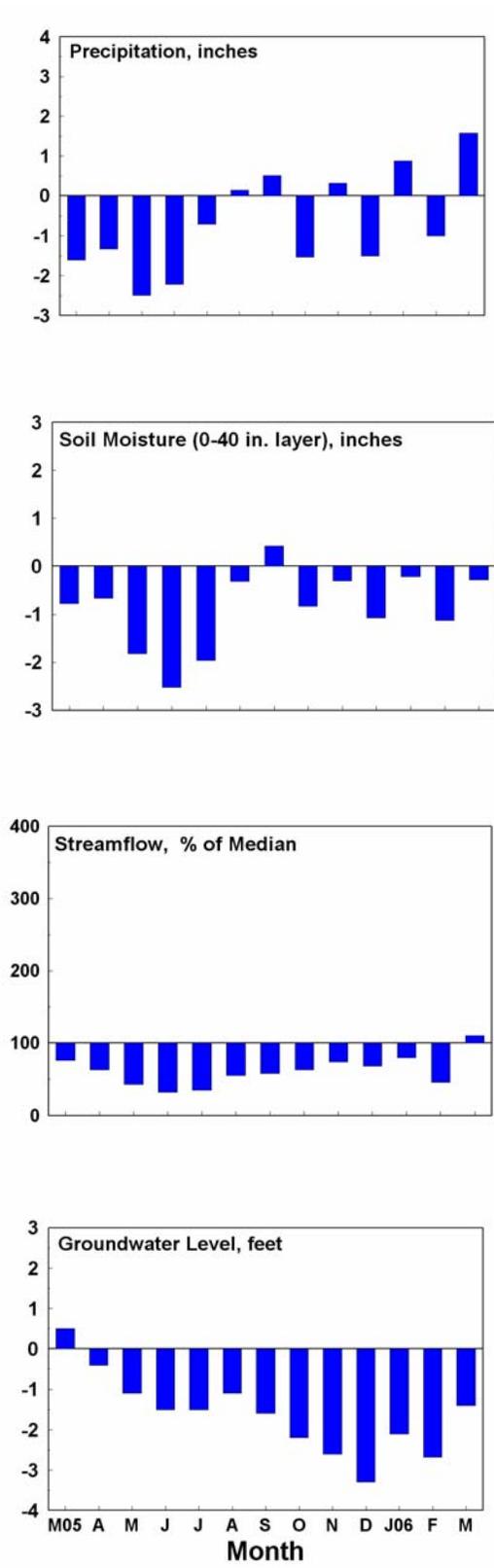


Figure 10. Statewide departures from normal.

Source: Illinois State Water Survey