Scientists: Threats of drought loom in future

By GARY BURCHFIELD

COLUMBIA, Mo. — Golf course superintendents not prepared for drought may want to institute a long-range management plan that includes the possibility of extended dry weather.

Climate models developed by researchers at the University of Missouri, Columbia, indicate a good probability of extremely dry conditions in the next four or five years, especially in the country's mid-section.

The past four years already have seen major droughts across Texas, Oklahoma and the Southern plains, much of the eastern Corn Belt and along the Eastern seaboard. Southwestern states suffered drought effects in 1996, 1998 and into 1999. Forest fires ravaged parts of Florida in 1997. Across South Carolina, 1999 rainfall was 16 to 20 inches below normal. Farmers in several areas have suffered major crop losses. Lawns and golf courses have seen their share of stress in several regions. Now, forecasters are predicting a high probability of more dry weather ahead.

The Missouri scientists studied precipitation, temperature and soil moisture to produce maps showing the drought potential after the first three years of the study project. The maps were produced using satellite, weather and ground-based data and showed that more than 2000 counties in the U.S. have had at least one year that can be defined as a drought year.

The scientists found that in 1996, about 25 percent of the country's counties were in drought conditions. In 1997, about 50 percent were in drought. In 1998, 60 percent of the country was in drought. This year, about 75 percent of the country is in drought, according to the scientists.

The scientists also found that the southeastern U.S. is particularly susceptible to drought conditions. In the southeastern U.S., about 80 percent of the counties were in drought conditions.

The scientists said that the drought conditions are likely to continue for another year. They said that the conditions are likely to continue for another year. They said that the conditions are likely to continue for another year. They said that the conditions are likely to continue for another year. They said that the conditions are likely to continue for another year. They said that the conditions are likely to continue for another year. They said that the conditions are likely to continue for another year. They said that the conditions are likely to continue for another year. They said that the conditions are likely to continue for another year.
Scientists warn of drought possibilities

Continued from page 29

tation patterns for the period 1885-1996 and determined that precipitation has followed an approximate 20-year cycle of wet and dry periods. The driest periods occurred in 1895-1900, 1915-20, 1935-40, 1955-60 and, most recently, in the late 1970s.

The most severe droughts were those of the 1930s and 1950s, and they extended over most of the contiguous United States. About 65 percent of the country was in “severe to extreme drought” during the 1930s. The Central Plains has not had a widespread severe drought for several years, but it may be due.

In fact, data compiled by the National Drought Mitigation Center, which is housed at the University of Nebraska, shows that severe drought conditions at the end of 1999 were present across a wide area of northeast Nebraska and northwest Iowa; across central Texas into Louisiana; and from eastern Missouri through Illinois, Indiana and much of Ohio and Kentucky. Year-to-date rainfall totals were 74 percent of normal at Little Rock, Ark., 67 percent at Lake Charles, La., and 63 percent in Houston.

Lincoln, Neb., recently experienced 49 days without precipitation — the fourth-longest dry spell in the city’s history — and the warmest November in 113 years of record-keeping.

Dr. Qi “Steve” Hu, assistant professor and agricultural climatologist at the University of Nebraska, analyzed historical climate data from weather stations across the Central Plains for the period 1895-1995. The data shows a significant 20-year precipitation cycle. Formerly at Missouri, Hu and his collaborators there found this 20-year precipitation cycle is related to similar 20-year cycles in the North Atlantic region.

“It seems that global circulation patterns are influenced by variations in sea-surface temperatures and sea-level pressure in the North Atlantic Ocean,” Hu said. “These variations directly affect the intensity and circulation of the anticyclone (jet stream) across the mid-section of the country.”

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Climatologists for several years have been pushing for more advance planning on steps to deal with drought conditions. States and localities typically have disaster plans for hurricanes, blizzards, floods, tornadoes, power outages, nuclear accidents — almost every type of disaster except drought.

While 29 states do have drought plans, most of these are response-oriented rather than mitigation-type plans that are aimed at reducing risk before drought occurs. That is beginning to change, though, and it may be just in time.

Texas is developing a more comprehensive drought-mitigation plan. Nebraska is revising its drought plan (originally developed in 1986) to place more emphasis on mitigation. New Mexico recently developed a mitigation plan.

As a result of the widespread 1996 drought, the U.S. Congress passed the National Drought Policy Act in 1998 and set up a commission, which is to provide Congress and the President with recommendations on an integrated national drought policy by April.

“It’s a question of risk management vs. crisis management,” said Dr. Don Wilhite, director of the National Drought Mitigation Center (NDMC). “Because drought is often a local phenomenon or within a limited area, it’s not always major ‘news.’ But for the past 100 years, an average of 15 percent of the U.S. every year has suffered some type of drought condition. California and Nevada suffered seven

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Droughts worse centuries ago
Drought conditions actually have moderated compared to past times. Scientists at the University of Minnesota have studied long-term climate changes over the past 2,300 years by studying layered sediments. Droughts worse than the 1930s Dust Bowl were common before AD 1200.
The most pronounced drought periods were AD 200-370, AD 700-850 and AD 1000-1200. Drought conditions in past centuries have persisted longer in the Great Plains region than in other areas of the country.
It is due to the region’s continental location, where differing air masses tend to collide, such as warm dry air from the Pacific, cold dry air from the Arctic and moist tropical air from the Gulf of Mexico.
Will long-term droughts reoccur? Perhaps. But governments and organizations will have advance notice and better information available to help counter drought effects, thanks to the National Drought Mitigation Center.

Scientists warn of droughts
Continued from previous page
consecutive drought years from the late 1980s through the early 1990s, but it seldom made the national headlines because droughts are non-structural, compared to earthquakes, floods, tornadoes, etc."
The NDMC was established in 1995, with support from the U.S. Department of Agriculture. The center is partnering with USDA and NOAA’s Climate Prediction Center to track developing drought conditions anywhere in the country. The most visible result is the weekly Drought Monitor, which was unveiled at the White House in Washington last July and is available to anyone via the Internet.
The map provides an up-to-date summary of current drought areas across the 50 states, Puerto Rico and the Pacific possessions. It incorporates information from many sources at state, regional and national levels. Besides current conditions, it provides an outlook on where drought is likely to develop or worsen in the months ahead. The Drought Monitor classifies drought by severity levels.
"It’s designed to provide a ‘big picture,’ so the general public, media, government officials and others can see what is happening around the country," Wilhite said. The map, updated weekly, is not designed to depict local conditions or replace drought warnings and watches issued by local or regional government entities, he said. "Local situations can be better interpreted by officials in the area.
"What it is designed to do is highlight emerging trouble spots to help state and federal agencies address potential problems earlier," he added.
"The idea is to enable agencies to coordinate planning and response efforts so they can implement mitigation programs to lessen drought impacts."
Wilhite said there is no universal drought definition, so the NDMC uses several indices to compile the Drought Monitor map, which shows where drought is emerging and where it is lingering across the United States. The monitor also shows how drought is affecting agriculture, wildfire danger and water supplies.
"It’s designed for drought and water planners and policymakers," said Wilhite. "But many people find the information interesting. And, it’s as easy to understand as the Weather Channel’s travel advisory service."
The Drought Monitor and drought index maps can be accessed on the World Wide Web at http://enso.unl.edu/monitor or <http://enso.unl.edu/monitor>.

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