

# Drought threat is real from East to West Coast

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tees and fairways will still have a pretty high level of maintenance."

However, the northern areas may mandate 40-percent reduction which, Hoose said, would be severe. "It would require decreasing or eliminating watering in the fairways and roughs. Maybe they could water once or twice a week. A lot of grass would be lost."

Most of the turfgrasses in that area are the poa annua, annual bluegrass, bentgrasses.

According to Hoos, under minimal watering conditions, perennial grasses go dormant but "a lot will come back. They will also have to reseed. That makes the seed companies happy."

Some regions are not affected. Oklahoma, for example, often thought of as dry because of the dust bowl era in the 1930s, has not suffered drought conditions. At Oak Tree Golf Club, site of last year's PGA Championship, they have had more water than average the last two years.

"Last year they had 90 percent of normal," Hoos said. "They are in good shape."

### The Midwest

In many parts of the country fall rains helped. At Butler National Golf Club in Oakbrook, Ill., golf course manager Oscar L. Miles feels they are more fortunate than many places in Illinois. Their rainfall is normally plentiful because they are close to Lake Michigan.

"We had nice rainfall last fall," Miles said. "It wet the surface 12 inches. However, we are deficient this year. Last year we had 107 percent of normal. November was very wet here. But this year we've had 46 percent in January, 79 percent in February and 75 percent in March."

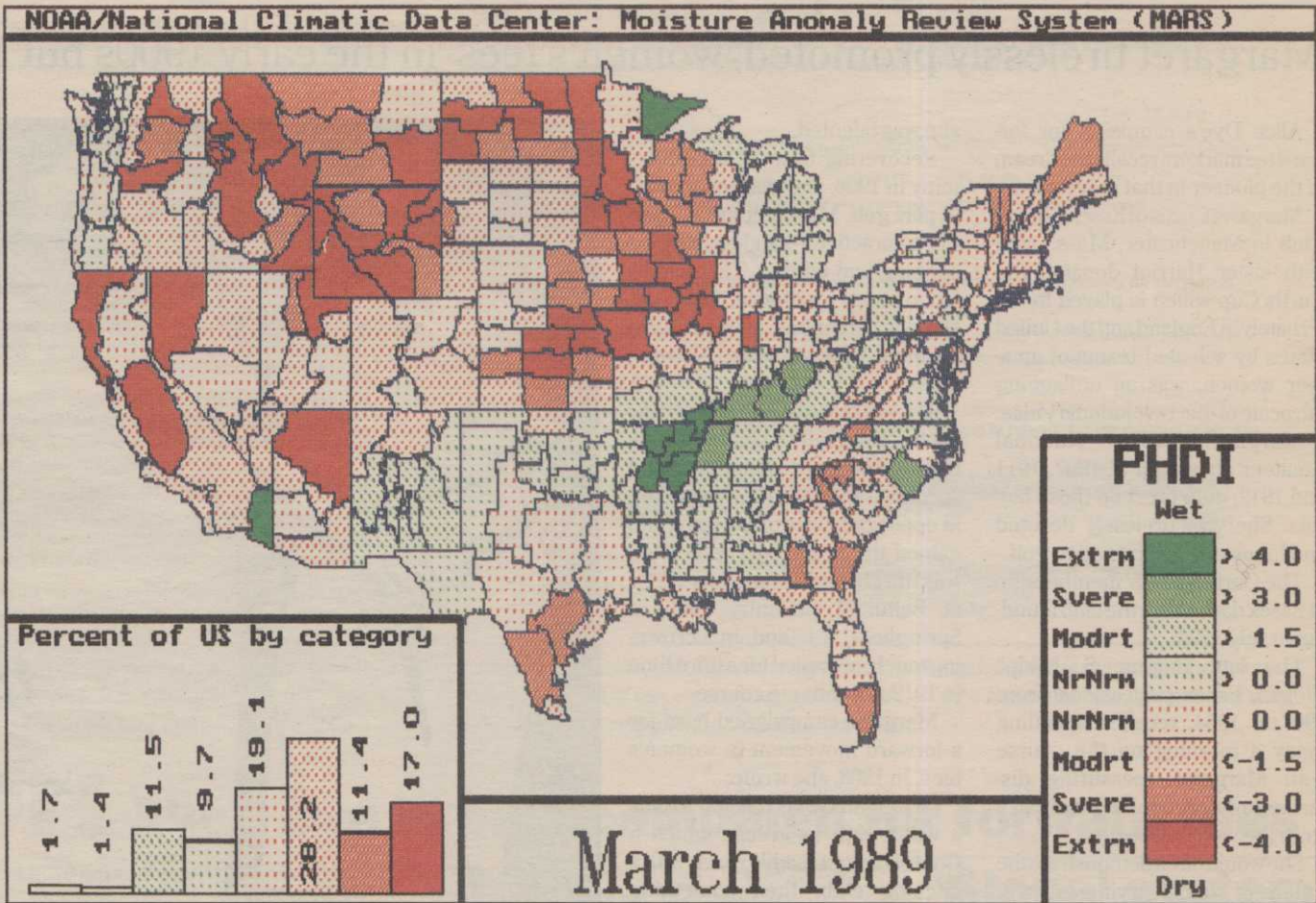
The moisture isn't replenished when the ground is frozen, he explained.

"We had rains, but the ground was frozen, so it ran off," Miles said of conditions in early winter. "But we've had 1 1/4 inches recently and that wet ground 8 inches deep. We need substantial rainfall soon. It takes 2 to 3 inches of rainfall to wet a foot of soil. We need to have the soil wet 2 to 3 feet deep."

Miles feels conditions farther south and west in Illinois are more severe. A big concern are the trees.

"We won't see it (extent of damage) until budding," he said.

Damage shows with less budding and reduced vertical shoot growth.



This Palmer Hydrological Drought Index map reflects long-term drought areas. It takes into account not only rainfall, but also temperatures, evaporation and soil conditions. Drought areas are colored red, extreme wetness areas green. The more extreme the

numbers, the more extreme the conditions. Zero is normal soil moisture conditions. Long-term index value standard is negative for drought, positive for wetness.

### Southern New England

Most of southern New England is adversely affected by drought, according to Jay Reagan, superintendent at the TPC of Connecticut. "We are 5 inches below the water table right now," Reagan said in April. "We hardly had any snow last winter and only 6 inches of rain."

Last summer and fall, they were hand-syringing and watering on their course. "We have a totally manual irrigation system, so it takes a lot of work. The roughs burned out completely," he said.

In the roughs there was the added problem of rain and gallery traffic during tournament week of the Greater Hartford Open. Many areas of the course are relatively new, also, and were trampled by crowds.

The TPC of Connecticut gets water from a seven-acre, natural pond on site. "The pond level was down and it was critical. We were below the intake lines," Reagan said. They

have imported water from the town water supply. Another 10,000-square-foot water area on the course is not used for irrigation.

TPC has not seen a tree problem yet. However, according to Hoos, severe tree problems will not materialize until next year. The first sign of trouble is defoliation, he said. "If there is a second year of substantial loss, then you may lose the tree. It depends on how efficient the type of tree is and what kind of root system it has. Needle trees are more efficient. They don't transpire as much. But the root system of other broadleaf trees may be better."

At Westchester Country Club in Rye, N.Y., they are in a water-cutback situation. "If you have your own water, you can water greens and tees, but no fairways," said Patty Knaggs, superintendent at Westchester. "April 17th, Phase II of the water conservation program started, and then we could water tees and

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Relative ranking of evaporation rates for the most commonly used cultivars of the major cool- and warm-season turfgrasses.\*

Relative Ranking	ET Rate (mm/day)	Turfgrass	
		Cool-season	Warm-season
Very low	<6		Buffalograss
Low	6-7		Bermudagrass hybrids
			Centipedegrass
			Bermudagrass
			Zoysiagrass
			Blue Grama
Medium	7-8.5	Hard fescue	Bahiagrass
		Chewings fescue	Seashore Paspalum
		Red fescue	St. Augustinegrass
			Zoysiagrass, Emerald
High	8.5-10	Perennial ryegrass	
Very high	>10	Tall fescue	
		Creeping bentgrass	
		Annual bluegrass	
		Kentucky bluegrass	
		Italian ryegrass	

\* — Grown in their respective climatic regions of adaptation and optimum culture regime. Cultural or environmental factors that cause a drastic change in leaf area or shoot density of a given species may result in a significant shift in its relative ranking compared to the other species.

## Scientists make advances in grasses

Developing new turfgrasses and management techniques that will reduce golf course maintenance costs and water use by 50 percent by 1993 remains the goal of researchers.

Relative ranking of evapotranspiration rates for the most commonly used cultivars of the major cool- and warm season turfgrass has been released by the Texas Agricultural Experiment Station at College Station, Texas.

Drs. James B. Beard and Ki S. Kim, Texas A&M University turfgrass stress physiologists, prepared the table for the USGA Green Section Record.

Water use rate is the total amount of water required for turfgrass growth, plus the quantity transpired from the grass plant

and evaporated from associated soil surfaces.

The comparative water use rates of turfgrass species, Beard and Kim state, are distinctly different from the relative drought resistances, because each is a distinctly different physiological phenomenon.

The differences among 19 turfgrass species used throughout North America are substantial, they point out.

Excellent research progress also is reported at New Mexico State University, where Dr. Arden Baltensperger has developed Sahara, an improved variety of seeded common bermudagrass soon to be on the commercial market.

Dark green in color with exceptional drought resistance and lower growing habit with shorter inter-

nodes (tighter turf), Sahara has proved an excellent seed producer.

Dr. Terry Riordan at the University of Nebraska is developing new buffalograsses.

The release of a superior vegetative cultivar is due this year, and improved seeded types are expected within a few years.

Reports from Texas A&M, Dallas, the DSIR in New Zealand, and Penn State and Rhode Island universities detail progress in developing improved bentgrasses with greater heat tolerance, lower water and fertilizer needs, and disease resistance — all without loss of superior playing qualities.

The target date of 1991 or 1992 for release of the early, promising new bentgrasses holds firm.