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Southeast Water Scarcity Blamed on Overpopulation, Not Climate

NEW YORK, New York, October 20, 2009 (ENS) - The most recent drought in the southeastern United States destroyed billions of dollars worth of crops, drained reservoirs and touched off legal wars among a half-dozen states, but the havoc came not from exceptional dryness but from booming population and bad planning, says a new Columbia University study.

Researchers from Columbia's Lamont-Doherty Earth Observatory have showed that the 2005-2007 drought was mild compared to many others and was no worse than one just a decade ago.

The study finds that climate change has played no detectable role in the frequency or severity of droughts in the region, and its future effects there are uncertain; but droughts there are essentially unpredictable, and could strike again at any time. The study appears in the October edition of the "Journal of Climate."

"The drought that caused so much trouble was pathetically normal and short, far less than what the climate system is capable of generating," said lead author Richard Seager, a climate modeler at Lamont-Doherty.

"People were saying that this was a 100-year drought, but it was pretty run-of-the-mill," he said. "The problem is, in the last 10 years population has grown phenomenally, and hardly anyone, including the politicians, has been paying any attention."

Region wide, the drought ran from late 2005 to winter 2007-2008, though many areas in the south were still dry until September, when the weather turned and flooding killed at least eight people.

During the height of the dry period, Atlanta's main reservoir, Lake Lanier, sank more than 14 feet, usage restrictions were declared, and states sued each other and the federal government over use of water in rivers and reservoirs.

Shrunken Lake Lanier, November 2007. (Photo by Robert Lz)

Seager and his coauthors Alexandrina Tzanova and Jennifer Nakamura put the period in context by comparing it with instrumental weather records from the last century and studies of tree-growth rings, which vary according to rainfall, for the last 1,000 years.

These records show that more severe, extended region-wide droughts came in 1555-1574, 1798-1826 and 1834-1861.

The 1500s drought, which ran into the 1600s in some areas, has been linked by other studies to the destruction of early Spanish and English New World colonies, including Jamestown, Virginia, where 80 percent of settlers died in a short time.

The 20th century was relatively wet, but the study showed that even the 1998-2002 drought was worse than that in 2005-2007.

The factor that has changed is population. In 1990, Georgia, which uses a quarter of the region's water, had 6.5 million people. By 2007, there were 9.5 million - a rise of almost 50 percent in 17 years.

The population is still growing with many people migrating into the region, but little has been done to increase water storage or reduce consumption, the study finds. There has been increased sewage discharge near water supplies, and lands have been covered with impermeable roofs, roads and parking lots, which allow rainfall to run off instead of storing it.

Previous studies by Seager and his colleagues have shown that droughts in the American Southwest and Great Plains states are controlled by cyclic changes in tropical Pacific Ocean sea-surface temperatures - the El Niño-Southern Oscillation cycle. This means that dry weather, which goes along with the cold phase of the cycle, can be predicted to some extent.

But in the current study, the scientists found only a weak correlation between Southeast weather and the tropical Pacific.

Instead, says Seager, dry spells appear to be generated by random changes in regional atmospheric circulation. This means Southeast weather could dry up at any time.

Seager's studies also suggest that global warming caused by human activities is beginning to disturb precipitation patterns across the globe. As a result, he says, the Southwest may have already entered a period of long-term aridity.

In contrast, global warming does not appear to have yet affected rainfall one way or the other in the Southeast.

Most climate models project that higher temperatures will increase rainfall in the Southeast, but as temperatures rise, evaporation will also increase.

At best, says Seager, the two effects may balance each other out; at worst, evaporation will prove stronger, and result in drier soils and reduced river flows in the long term.

"It was a lot drier in the 19th century than it has been recently, but there were so few people around, it didn't harm anyone," said Seager. "Now, we are building big urban centers that make us vulnerable to even slight downturns."

Mark Svoboda, a climatologist at the National Drought Mitigation Center at the University of Nebraska who was not involved in the Columbia research, said of the study's results, "This should be a wake-up call. If this is not the worst case scenario, what are we going to do when the worst-case scenario arrives?"

David Stahle, a tree-ring scientist at the University of Arkansas who made the link between 1500s-1600s droughts and the struggles of early Southeast colonies, said settlers then were so vulnerable because they had just arrived and lacked sufficient infrastructure or backup supplies.

Stahle called the Lamont study "a bedtime story with a moral for modern times."

"Are we returning to a period of sensitivity and danger like the colonists experienced?" said Stahle. "Yes, it looks like we are."

"The Columbia research shows that while the drought was a natural event, the water shortages were indeed caused by humans," said Randy Serraglio, conservation advocate at the Center for Biological Diversity. "This is what happens when you have a dramatically increasing population relying on the same limited supply of water."

"The culprit is us - a rapidly growing human population with unsustainable consumption habits," Serraglio said. "Unfortunately, it is usually other species that pay the price for our inability to responsibly manage growth and consumption."