Central Texas drought: Dire or dwindling?

By Jim Spencer
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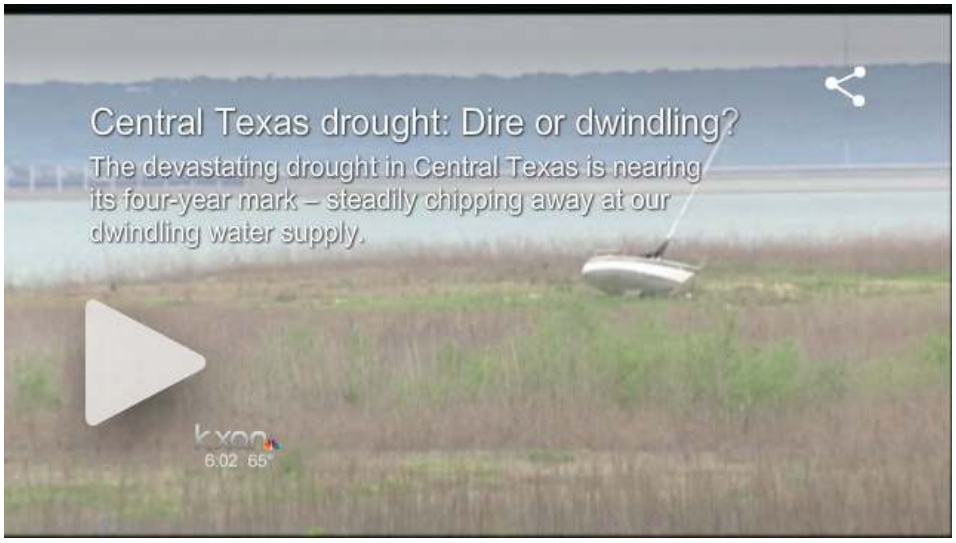

AUSTIN (KXAN) – A little-known weather pattern may be responsible for what could become Texas' worst drought ever. It has to do with the interaction between the Pacific and Atlantic Oceans.

The Pacific Decadal Oscillation (PDO) and Atlantic Multi-Decadal Oscillation (AMO) relate to the cycling between warm and cool waters in both oceans. The patterns were first identified in the 1990s–so recently, scientists still do not fully understand them. What has become apparent though, is these long-term ocean cycles affect Texas rainfall.

When the PDO is positive, warm waters spread throughout the eastern Pacific Ocean, energizing the jet stream and driving rain-making storms across the central and southern U.S. When the PDO is negative, warm water stays in the western Pacific closer to the coasts of Japan and South Korea, and the water near the U.S. coast is cooler, which is not conducive to rain development.

	Pacific Decadal Oscillation	**Atlantic Multi-Decadal Oscillation**
Positive	• More rain for Texas	• Less rain for Texas • More Hurricanes
Negative	• Less rain for Texas	• More rain for Texas

In the Atlantic, a positive AMO relates to warmer than normal water across the northern Atlantic Ocean, bringing more rain to Florida, Europe, and parts of northern Africa; it keeps Texas in a drier weather pattern. When the AMO is negative, cooler waters take over the northern Atlantic Ocean, which can change global atmospheric patterns in a way that brings more rain to Texas. The PDO can last between 20 and 30 years. The AMO can last anywhere from 20 to 40 years.

Texas' best chance for rain comes when PDO is positive and AMO is negative.

But for most of the last decade, the opposite has been in place. The PDO has been negative since 2003, with the exception of a two-year gap from 2005 to 2007, and the AMO has been positive since 1995; both have contributed to persistent droughts.

Dr. John Nielsen-Gammon, the Texas state climatologist and a professor of Atmospheric Science at Texas A&M University, says our current drought pattern may not end anytime soon.

"We might still be in drought for another 10 or 15 years," Nielsen-Gammon said.

If true, Central Texas' ongoing dry spell could linger to 2030.

“The last time that happened was in the 1950s, which was not a good time for rainfall either, “Nielsen-Gammon said. “And this drought right now, by my reckoning, is probably only second to the 1950s drought in Texas’ recorded history for severity.”

Our current drought already could become the worst in Texas history by next year. The prospect of another 15 years of persistent dry weather is frightening.

“If we do not get out of the drought this year and it intrudes into 2015, we’re looking at something equivalent to the drought of the 1950s,” George Bomar, the author of “Texas Weather” said.

During the early 1950s, Lakes Travis and Buchanan saw their all-time lows. And, just 20 years earlier, other parts of Texas were hit hard by the Dust Bowl. It forced farmers and ranchers out of parts of Texas, Oklahoma, New Mexico, Colorado and Kansas due to terrible drought conditions. Dust blew across the landscape, killing crops and animals.

“We might still be in drought for another 10 or 15 years,”
— Dr. John Nielsen-Gammon

While it is a terrible scenario, another decade of drought is not a sure thing.

“Unfortunately we don’t have the ability to forecast the ocean patterns say two or three years in advance, so the whole pattern could be over in five years or it could last 15 or more,” Nielsen-Gammon said.

With conditions as dry as they are now, it will take more than a few typical spring rains to make a difference.

“We look for rain to help with the reservoir levels in the Highland Lakes but at this point, the first several inches of rain are going to go into the ground and stay there,” Nielsen-Gammon said. “It’s going to take several months of unusually wet weather just to reduce the normal runoff and there’s no sign of that happening.”

And that may mean more restrictions on how Central Texans use their water. The amount of water in Lakes Buchanan and Travis are the determining factor for city of Austin water restrictions. Currently, Austin water customers are observing stage 2 restrictions, triggered when the combined storage of Lakes Travis and Buchanan drop below 900,000 acre feet (45% of capacity or more than 293 billion gallons).

Stage 3 restrictions may be just around the corner. If Lakes Travis and Buchanan drop below a combined capacity of 600,000 acre feet (30% capacity or around 195 billion gallons), the city of Austin will initiate stage 3 restrictions. If the upper Colorado River basin doesn’t get significant rain soon, an LCRA report (http://www.lcra.org/water/water-supply/drought-update/Documents/DroughtUpdate_StorageProjection.pdf) says that could happen by July.

GOING IN-DEPTH // 1950′s Drought

- Rainfall was 40 percent below avarage from 1950 to 1957
- In 1952, Lubbock went the entire year without a trace of rain fall
- In 1953,75 percent of the state

Stage 3 rules are the most strict the city can enforce without declaring an emergency. The city’s website says (http://www.austintexas.gov/department/drought-update) the criteria for implementing stage 4 restrictions is not set in stone. Instead, the city of Austin could go to stage 4 until one of the following factors: “as determined by City Manager, system outage, equipment failure, contamination of water source or other source or other emergencies.”

Other cities whose water restrictions could get more tough include Cedar Park (http://www.cedarparktexas.gov/index.aspx?page=138), Pflugerville (http://www.pflugervilletx.gov/index.aspx?nid=1626), Burnet (http://www.cityofburnet.com/city_departments/utilities_drought.htm), Lago Vista (http://lagovistatexas.org/), Marble Falls (http://ci.marble-falls.tx.us/). For a complete list of cities which cities rely on LCRA water, click here. (http://www.lcra.org/water/utilities/pages/water-use-restrictions.aspx)

On a positive note, even long term droughts like that of the 1950s will usually be interrupted by occasional pauses, usually in the form of a flood. And, there is a chance our drought could end by this time next year. “Models are predicting about a 70 percent probability of it happening,” Dr. Kerry Cook, a professor of Geological Science at the University of Texas at Austin, said. “I think those numbers are going to firm up quite a bit over the next month.”

Jim Spencer takes on drought predictions (05/13/2014)

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Tuesday May 13, 2014

7:29 **KXAN Moderator:** Welcome to our Drought Q&A with Jim Spencer and David Yeomans.

7:33 **Comment From Kip**
David, when does the El Nino begin?

7:34 **Comment From Ian McKenna**
What happens if you go to stage 3 restrictions and we still don't get rain?

7:35 **David Yeomans:** Kip, usually El Nino events begin in the fall or even early winter months. But this one is coming on pretty strong, pretty early - and some are saying it may even begin by late this summer.

7:35 **Comment From Tim**
What's the outlook for El Nino in the near term

7:36 **Jim Spencer:** There are stage 4 and 5 restrictions, but they have never been used.
What those restrictions would include exactly has not yet been fully determined by the city.

7:37 **Comment From Guest**
Wonderful part 1 today Jim. Another reason why you and your team are the best in Austin!

Join the discussion…

Lothario · 2 hours ago

I've been living in Austin for 7 months now and i can honestly say the thing i hate most about this city is the lack of rain. That's a game changer for me.

The rain we got yesterday is the most rain we've had in one day since the 2013 Halloween Floods ....

OMG that's 7 months between healthy doses of rain ....

Maybe a hurricane will land in Texas and head north towards Austin and bring this area some rain.....that's the best hope for now ...

Reply · Share ›

JDawgATX · 3 hours ago

I think El Nino is all but set in stone for us, it's not if we get an El Nino, its how strong will this El Nino be. It could be a strong to possibly a Super El Nino which has been well over a decade since the last one. Correct me if I am wrong but I am under the impression that the stronger the El Nino is, the earlier in the year we can feel its effects. Looking at the water temps along the equatorial Pacific, the waters are pretty warm and are getting warmer.

I am also concerned about what effect climate change is having on the PDO cycle and how the El Nino, La Nina cycles may change due to it.

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Kris Rogers · 3 hours ago

Does anyone remember the Memorial Day flood of 1981? That is what we need now. If you don't know about it or were not in Austin when it happened, I suggest you Google it and read about it. I have lived in the Austin area since 1977. I have never seen Lake Travis so full that the water went over the spillway, but it was very close one time! I saw heavy earth moving equipment at Windy Point covered in water many years ago because the crews could not move the equipment in time after a heavy rainfall. Have faith, the lakes will fill again!

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Guest · 4 hours ago

Great report on drought @kxan Pls explain why 50s drought is the standard when geology from 1-10K years in ATX was far worse?

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