

Austin American-Statesman 30 June 2009



Rodolfo Gonzalez AMERICAN-STATESMAN

Malcolm Cleaveland of the University of Arkansas takes core samples of baldcypress trees at Krause Springs in Spicewood. The width between tree rings indicates how wet a year was.

Scientists use trees to unwind 1,000 years of weather history

By Juana Summers

AMERICAN-STATESMAN STAFF

SPICEWOOD — Set on more than 115 acres, Krause Springs is home to hundreds of trees — some more than 1,000 years old — that have preserved a continuous record of climatological history.

As Central Texas racks up two weeks of triple-digit temperatures, University of Arkansas researcher Malcolm Cleaveland is using trees to study historic droughts in Texas. He's made countless trips to Central Texas to

uncover clues about "megadroughts" of the past and to see what the future holds.

Using a tool called an increment borer, Cleaveland and his research team drill holes into the trunks of baldcypress trees to take samples. Taking these samples doesn't harm the trees, Cleaveland said.

"The tree rings give you a perspective you can't get in any other way," he said.

Trees typically grow one ring each year. A tree grows a narrow ring in a dry year and

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a wider ring in a wet year.

Cleaveland's research assistants store the samples in plastic straws to take back to their Arkansas lab, where they are mounted and sanded down. The core samples are then viewed under a microscope to count the rings.

It's a long process, said Daniel Stahle, an Arkansas undergraduate research assistant. The work probably will take them into the fall. If a sample is missing rings or rotted in some parts, the researchers cross-date among the different trees to count the missing rings.

The researchers are focusing on baldcypress because the trees are long-lived and are softer than other trees, making it easier to get samples. Researchers took samples from 47 trees at Krause Springs.

Though the trees there are large, they are relatively young and fast-growing, Cleaveland said. Still, their rings offer some rich data.

Findings from the research could help state and local officials plan for future water needs and manage the Edwards Aquifer, said Todd Votteler, project manager for the Guadalupe-Blanco River Authority.

"We're often challenged by the requirement to get through a 10-year drought," Votteler said. Dealing with something like the 40-year drought that took hold in the late 16th century, a megadrought, is something the state isn't prepared for, he said.

Cleaveland's research shows that the decade-long "drought of record" in the 1940s and 1950s that many state water providers use as a benchmark to plan for water shortages might not be the best guideline. He said that recent droughts in the area are relatively minor compared with the historic droughts he's studying.

He's also looking at the historical climate of Central Texas to see what the future could hold for area weather.

Asked if the trees show whether rain is coming soon, Cleaveland said he's not sure yet.

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Studying area tree core samples — taken with a tool called an increment borer — could help officials plan for future water needs, expert says.

Climate insight from trees

Researchers are taking core samples from trees across Texas. Their goal is to extract climate data by measuring the size of the trees' growth rings.



Source: Malcolm Cleaveland, University of Arkansas AMERICAN-STATESMAN

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See a video and more photos from Krause Springs with this story online.