

Longleaf Pine Growth Responses to Climate Fluctuations and Drought

In recent decades, the southeastern U.S. has experienced drastic fluctuations between wet and dry growing conditions from year to year, and it is not fully understood how these fluctuations have influenced longleaf pine growth. To address this topic, we cored longleaf and slash pines across The Jones Center at Ichauway (located in southwest Georgia) to determine growth responses to climate and droughts from 1930–2020. To determine growth response to droughts, we used a resistance index which compares growth during a drought to growth prior to drought. We also used a resilience index which compares growth before a drought event to growth after drought.



*Campôa cores a pine to obtain a tree ring sample for growth analysis.
Photo by Joshua Puhlick*

We found that in recent decades, climate conditions during the growing season became more influential on longleaf pine growth than previous year's climate conditions. This is concerning, given that drought severity during the growing season has been increasing. Silvicultural treatments, such as thinning to reduce tree vulnerability to drought and promoting other climate-adapted species in mixture with longleaf pine, should be considered under this new climate paradigm.

MORE INFORMATION

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KEY POINTS

We found that longleaf pines and slash pines were less resilient to frequent and intense droughts that have occurred since the 2000s in comparison to droughts that occurred during the 1950s.

Because our study involved examining the growth response of the same trees over time, it is possible that as trees aged, they became less resilient to droughts.

While there was not a statistically significant difference in longleaf pine resistance to droughts that occurred during the 1950s and those that have occurred since the 2000s, trees were more resistant to the earliest drought than the subsequent drought within each of the time periods.