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The Effect of Environmental Conditions on Tree-ring Growth in *Pinus cembroides*

This poster addresses the relationship between climate and tree ring growth of *Pinus cembroides* from Guanajuato, Mexico. Tree-ring dating (dendrochronology) is based on the observation that many trees grow one ring annually, so that the number of rings reflects the age of the tree. In addition, tree growth varies in response to seasonal climate change and other environmental variables. Wider rings indicate favorable growth conditions, and narrow rings indicate slower growth due to less favorable circumstances such as drought.

In collaboration with the Cornell University Tree-Ring Laboratory, this project collected and measured an assemblage of ten tree core samples from the Sierra Santa Barbara, Guanajuato, Mexico. Resulting measurements were cross-dated and summed to form a single measurement chronology, which was then statistically examined against instrumental measures of environmental factors such as precipitation and temperature. Significant findings will indicate the conditions under which trees in this region respond to environmental fluctuation. Given the semi-arid environment, I expect tree growth to vary primarily due to precipitation. Furthermore, with the increasing effects of climate change, which in Mexico will result in lower precipitation and increased temperatures, I expect to see reduced tree growth over the last few decades.

A complete modern tree-ring chronology of *Pinus cembroides* can inform use about the environmental variables that contribute to tree growth as well as environmental fluctuations that may connect with short- or long-term climate changes in this region. In the future, this chronology can be used as an analogy to interpret the environmental conditions that influenced the growth of prehistoric trees used to construct buildings (and, ultimately, cultural changes) in the adjacent archaeological site of El C6poro.