

# Global Warming and droughts

## Science-based analyses of America's key environmental issues

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**Claim:** *Global Warming will increase severity of droughts.*

In considering a large number of research findings, it would appear that the warming of the past century or so, which is bringing us ever closer to Medieval Warm Period conditions, has - if anything - **tended to reduce the frequency and severity of drought throughout the United States**. These observations make the claims of climate alarmists appear doubly wrong: not only does global warming not produce more frequent and severe droughts in the United States, it seems to do just the opposite.

Through careful studies of growth-rings of long-lived trees, a record of drought conditions in the American Southwest extending back to 1200 A.D. (deMenocal, 2001) shows that drought conditions in the southwest **have not been especially worse in the last 40 years** when the carbon dioxide forcing on global climate are purported to be the most dominant. Expectations to the contrary are derived from climate model "scenarios." Are the more severe droughts of the past centuries - free of man-made CO<sub>2</sub> forcing - also in line with modeled expectations? Not at all.

In the words of **deMenocal** (2001): "Water availability, rather than temperature, is the key climatic determinant for life in semiarid expanses across the planet. Drought often conjures up images of the Dust Bowl drought of the 1930s, which lasted 6 years (1933-38) and resulted in one of the most devastating and well-documented agricultural, economic, and social disasters in the history of the United States. The drought was triggered by a large and widespread reduction in rainfall across the American West, particularly across the northern Great Plains. It displaced millions of people, cost over \$1 billion (in 1930s U.S. dollars) in federal support, and contributed to a nascent economic collapse. ... A subsequent decadal-scale drought in the 1950s was also severe but less widespread, mainly impacting the American Southwest, where improved land use practices and disaster relief programs mitigated its effects.

How did the 1930s and 1950s droughts compare with other historic and prehistoric droughts? In a comprehensive analysis of hundreds of tree-ring chronologies from across the United States, Cook and others established a network of summer drought reconstructions extending back to 1200 A.D. This reconstruction documents **much more persistent droughts before the 1600s**. The so-called "megadroughts" were extremely intense, persisted over many decades, and recurred across the American Southwest roughly once or twice every 500 years. Reconstructed conditions during the largest of these multi-decadal droughts **far surpassed** those during droughts recorded within the past 150 years (the period for which extensive instrumental data are available). Evidence for these and other **mega-droughts** have been found in detailed lake sediment records, with additional evidence for even longer, century-scale droughts in California before 1350 and 1110 A.D."

**Update:** [Cronin et al. \(2000\)](#) studied the salinity gradient across sediment cores retrieved from Chesapeake Bay, the largest estuary in the United States, in an effort to determine precipitation variability in the surrounding watershed over the past 1000 years. From this record, they learned that the region had experienced several "megadroughts" of 60-70 years duration, some of which they describe as being "more severe than twentieth century droughts."

[Fritz et al. \(2000\)](#) used sediment cores from three North Dakota lakes to construct a 2000-year history of drought in the Northern Great Plains. Their data also suggest that "droughts equal or greater in magnitude to those of the Dust Bowl period were a common occurrence during the last 2000 years."

[Gray et al. \(2003\)](#) report that "strong multidecadal phasing of moisture variation was present in all regions [of the central and southern Rocky Mountains] during the late 16th century megadrought."

[Ni et al. \(2002\)](#), who developed a 1000-year history of cool-season (November-April) precipitation for each climate division in Arizona and New Mexico from a network of 19 tree-ring chronologies. They found, in their words, that "sustained dry periods comparable to the 1950s drought" occurred in "the late 1000s, the mid 1100s, 1570-97, 1664-70, the 1740s, the 1770s, and the late 1800s."

**Benson et al. (2002)** studied cored sediments from Pyramid Lake, Nevada. Over the most recent 2740 years, drought durations there were found to have ranged from 20 to 100 years; while droughts of the historical period have generally lasted less than a decade. Likewise, Fritz et al. (2000) used sediment cores from three North Dakota lakes to construct a 2000-year history of drought in that part of the

Northern Great Plains. Their data also suggested that "droughts equal or greater in magnitude to those of the Dust Bowl period were a **common** occurrence during the last 2000 years."

Tree-ring data were used by **Hidalgo** et al. (2000) to construct a history of stream flow in the Upper Colorado River Basin, where they found "a near-centennial return period of extreme drought events" that went all the way back to the early 1500s. Tree rings were also used by **Stahle** et al. (2000) to develop a long-term history of drought over all of North America. The results of their study indicated that the **1930s Dust Bowl** drought was the United States' most (1) severe, (2) sustained and (3) wide-spread drought of the past 300 years, but that it was eclipsed in all three categories by a 16th century "megadrought" that "far exceeded any drought of the 20th century." In fact, they say "the 16th century drought was the most extreme prolonged drought in the past 2000 years." All **before the industrial age**.

Finally, in a review of the subject, **Woodhouse and Overpeck** (1998) concluded "twentieth-century droughts are not representative of the full range of drought variability that has occurred over the last 2000 years." Indeed, they say that the last hundred years have been characterized by droughts of "**moderate severity and comparatively short duration**, relative to the full range of past drought variability."

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